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ABSTRACT

This report of the results of the 1974-75 Florida National Assessment Replication in reading and mathematics at the 9-, 13-, and 17-year-old age levels consists of several major parts: an overview of the assessment design and methodology, comparisons of performance levels for groups of Florida students within each age level, comparisons of performance levels for groups of Florida students across age levels, and comparisons of Florida performance levels with National Assessment performance levels. Chapter 2 describes the design and methodology of Florida's National Assessment Replication in reading and mathematics. Chapter 3 reports comparisons of reading and mathematics performance levels for groups of Florida 9-, 13-, and 17-year-olds classified by home, school, and student characteristics. The reporting variables are sex, race, size and type of community, parents' education, reading materials in the home, and Spanish as a native language. Chapter 4 compares reading and mathematics performance levels across ages on items administered at more than one age. Chapter 5 presents comparisons of reading and mathematics performance levels for Florida students and National Assessment groups at ages 9, 13, and 17. Comparisons are made between Florida and the Nation and between Florida and the Southeast. Comparisons are also made between groups of students from Florida and the Nation classified according to sex, race, size and type of community, and parents' education. (Author/MV)

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An Analysis of the Results of the Florida Educational Assessment Using the NAEP Model Reading and Mathematics 1974-75

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Department of Education
Statewide Assessment Program
Tallahassee, Florida
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FOREWORD

In 1974-75 Florida Statewide Assessment conducted a study of Florida students in reading and mathematics. This was a special assessment based upon the National Assessment of Educational Progress which would provide data for comparison of performance of our students and the nation.

This replication was a joint effort among the Florida Department of Education, Student Assessment Section; the Westinghouse Learning Corporation/Measurement Research Center; and the Research Triangle Institute.

The authors of this report were from the Research Triangle Institute and included Larry E. Conaway, Educational Research Scientist, Maurice D. Fisher, Educational Research Scientist, and Lynne M. Johnson, Research Assistant. The project director was David L. Bayless, Senior Educational Sampling Statistician with Associate Project Director Larry E. Conaway, Educational Research Scientist.

Questions or comments about this report and requests for additional information should be directed to the Florida Department of Education, Division of Public Schools, Student Assessment Section, Tallahassee, Florida 32304 or by calling (904)488-8198.

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Chapter 1

A Perspective on Florida's National Assessment Replication

I. PURPOSE

Florida's accountability movement was created out of a need to improve the quality of education, make the state's educational program more efficient and economical, and accomplish constructive educational change. The Statewide Assessment Program was created as an outgrowth of the accountability movement. Statewide assessment is responsible for both objective-referenced testing and norm-referenced testing of Florida students.

Objective-referenced assessment provides information on the extent to which students are acquiring established basic skills. The rationale behind such a program involves a need for discovering whether the state is, in fact, fulfilling its responsibility to aid students in acquiring basic skills. Norm-referenced assessment provides information on the performance of Florida students compared to similar students in other places in the United States. This report, Florida's National Assessment Replication, is one portion of Statewide Assessment's norm-referenced testing program.

The purpose of the Statewide Assessment Program is to identify student strengths and weaknesses. Such identification is a necessary first step in designing educational programs which offer remediation in the areas of weakness.

II. BACKGROUND

Legislation passed in 1970 (Chapter 70-399, Laws of Florida) required the Commissioner of Education to develop evaluation procedures to objectively assess the progress of students at various grade levels and in various educational programs of the public schools.

In 1971, the State Board of Education adopted Goals for Education in Florida, which identified general outcomes expected of the educational system. The Legislature adopted the Educational Accountability Act of 1971 (Chapter 229.57, Florida Statutes), with major provisions relating to:

1. Establishment of major or ultimate statewide educational objectives for each grade level and subject area including, but not limited to, reading, writing, and mathematics, in the public schools.
2. Development of a uniform, statewide system of assessment, based in part on objective-referenced and in part on norm-referenced tests, to periodically determine pupil status, pupil progress, and the degree of achievement of established educational objectives.
3. Implementation of annual public reporting of assessment results by grade and subject area for each school, each district, and the state.
4. Administration of tests to students in selected grades in the basic areas of reading, writing, and mathematics.

The objective-referenced assessment program began operation in 1971 testing a sample of second and fourth graders on selected reading-related skills. In 1972-73, the program tested students in the third, sixth, and ninth grades on skills in reading, writing, and mathematics. A fourth domain, science, was added in 1973-74 at the sixth and ninth grade levels. In 1974-75, census testing was instituted in place of sampling procedures. Reading, writing, and mathematics were stabilized as testing domains, and science was dropped.

Norm-referenced data were collected for the first time in 1974-75 through this assessment, referred to as the National Assessment Replication (NAR). The NAR used test items from the National Assessment of Educational Progress (NAEP). Although NAEP items were objective based, the results were used in a normative manner by comparing the performance of representative samples of Florida, Southeast, and United States students on each item.

III. UTILIZATION

The reports prepared by the Statewide Assessment Program are useful to classroom teachers, school administrators, and district administrators. Other audiences include the legislature, parents, and the general public. Separate reports are written for each audience.

Classroom teachers use the results to identify specific skills in which individual students or groups of students require special attention. Teachers can then develop specific remediation for improvement in those areas.

School administrators use the reports to evaluate the performance of their school programs. They also report the results to parents through the Annual Report of School Progress.

Districts use the data to identify areas in which groups of students are performing at an unsatisfactory level. In this way priorities can be set and resources allocated to the weakest areas in the district's curriculum.

The legislative audience must be able to see the basic educational picture in each district and in the entire state. Their responsibilities lie in the broad policy area; thus, the unique information which they need is more detailed than that required by the general public. The legislative audience must know much more about the relationship between resource allocation, processes, and outcomes in order to make decisions between competing requests for funds and other scarce resources.

State law requires that assessment results be made public. The general public is informed through statewide press releases. Another way the data are made public is through the Annual Report of School Progress which each parent receives from his or her child's school. This report is required to contain information on the educational progress of the school including results of the Statewide Assessment Program.

Decision makers and the public need to know if the goals and objectives are being met. By measuring achievement of the objectives and reporting the results, the Statewide Assessment Program plays a major role in establishing and maintaining educational accountability.

IV. OUTLINE OF THIS REPORT

This report of the results of the 1974-75 Florida National Assessment Replication in reading and mathematics at the 9-, 13-, and 17-year-old age levels consists of several major parts: an overview of the assessment design and methodology, comparisons of performance levels for groups of Florida students within each age level, comparisons of performance levels for groups of Florida students across age levels, and comparisons of Florida performance levels with National Assessment performance levels.

Chapter 2 describes the design and methodology of Florida's National Assessment Replication in reading and mathematics. Various aspects of sampling, instrumentation, scoring, data collection, and data analysis are described to enable the reader to place the assessment results in perspective with the assessment design.

Chapter 3 reports comparions of reading and mathematics performance levels for groups of Florida 9-, 13-, and 17-year-olds classified by home, school, and student characteristics. The reporting variables are sex, race, size and type of community, parents' education, reading materials in the home, and Spanish as a native language.

Chapter 4 compares reading and mathematics performance levels across ages on items administered at more than one age.

Chapter 5 presents comparisons of reading and mathematics performance levels for Florida students and National Assessment groups at ages 9, 13, and 17. Comparisons are made between Florida and the Nation and between Florida and the Southeast. Comparisons are also made between groups of students from Florida and the Nation classified according to sex, race, size and type of community, and parents' education.

Chapter 2

Assessment Design and Methodology

I. INTRODUCTION

The design chosen for the Florida National Assessment Replication is similar to the one used by the National Assessment of Educational Progress (NAEP). NAEP conducts an annual nationwide survey that is designed to provide comprehensive information about the educational attainments of American children, youth, and young adults in certain subject areas. Florida's replication is an adaptation of the NAEP model and has as its primary goal the comparison of Florida's student performance in reading and mathematics with the nation's. To insure compatability between the two designs, the sampling, instrumentation, scoring, data collection, and analysis procedures employed by NAEP were very carefully replicated. The Research Triangle Institute (RTI) of North Carolina designed the sample, assisted the Florida Department of Education (FDOE) in instrumentation and data collection, and performed analysis and reporting tasks. The Measurement Research Center (MRC) of Iowa printed and scored the assessment booklets. Both RTI and MRC have performed similar tasks for NAEP, and both have worked extensively with other statewide assessment projects.

This chapter of the report presents an overview of the various aspects of the assessment design: sampling, instrumentation and scoring, data collection, and data analysis. Its purpose is to enable the reader to place the assessment results in perspective with the total assessment design. The results of Florida's National Assessment Replication are presented in detail in this report; however, the more technical descriptions of some of the methodological aspects have been submitted to the FDOE as separate reports.

II. SUMMARY OF THE SAMPLE DESIGN

A. Basic Requirements of the Sample Design

The sample design was planned to fulfill the following sample requirements specified by the FDOE for the in-school 9-, 13-, and 17-year-olds:

1) A statewide sample using NAEP's definitions of 9-, 13-, and 17-year-olds attending both public and non-public schools should be selected using random sampling methods.

2) At least one school should be selected across the three age group populations from each of Florida's 67 school districts.

3) Oversampling[1/] should be used to provide results approximately equal in statistical precision for the following three ethnic groups:

   a) Non-Black, English native language students

   b) Black, English native language students

   c) Spanish native language students.

RTI statisticians determined that a sample size of 500 to 600 students per group would meet the specified statistical precision.

4) The sampled population should include non-English speaking students. This subpopulation is not included in the NAEP sample and consequently will be excluded in all analyses involving Florida to NAEP comparisons but will be included in the within-Florida analyses involving the Spanish as a Native Language variable. The non-English speaking students are mostly in the special "English as a Second Language (ESL)" classes.

B. Description of the School Sample and Stratification Procedures

In order to insure representation of the three ethnic groups, it was necessary to form three major strata, or groups of schools, based on ethnicity: 1) a non-Spanish, or regular, school stratum; 2) a Spanish language school stratum; and 3) a small school stratum. The Spanish population is concentrated in the school districts of Dade, Hillsborough, Monroe, Hendry, and Palm Beach; therefore, the Spanish language, large school stratum was formed from these

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1/ Oversampling of a group means that the proportion of students selected for the sample from the group is higher than the actual proportion of the population. The weighting of each student in relation to his/her overall chance of being selected into the sample accounts for oversampling in the analyses of the assessment data.

districts so that the likelihood of Spanish language students being represented in the sample would be increased. A school was classified as Spanish if at least four Spanish-speaking students were enrolled. The remaining school population in the state was divided into the non-Spanish, or regular, school stratum and the small, or standby, school stratum. A school was classified as small if it had 14 or fewer estimated eligible students in the age group being considered. The regular school stratum represented all of the remaining schools which were not included in the Spanish language and small school strata. It should be emphasized that these three strata were formed for sampling purposes only, and the data for these groups were not analyzed separately. The composition of the school population and the sample by these three major school strata and by age classes is provided in Table 2.1. As shown in Table 2.1, a larger percentage of schools containing Spanish native language pupils were selected into the sample in order to meet the requirement of oversampling.

For all data analyses performed for the assessment, the students of these schools were weighted in relation to their chance of being selected into the sample. For example, if a Spanish student had a selection chance of 1 out of 10, he was given a weight of 10; i.e., he represented ten students in the assessed population. If a non-Spanish student had a selection chance of 1 out of 30, he was given a weight of 30; i.e., he represented 30 students in the assessed population. Thus, all reported assessment results were "weighted" using weights that reflected the way in which the students were selected into the sample.

1. Non-Spanish School Stratification

Within the non-Spanish, or regular, large school major stratum, the schools in each of the three age group sampling frames were stratified using school district income level, school size, and racial composition as stratification variables.

The school district income levels were defined as follows:

1) The low income district stratum was composed of the 28 districts with 20 percent or more of the families in 1970 with incomes below the poverty level.

2) The high income district stratum was composed of the 14 districts with 1970 median family incomes of $8,000 or more.

3) The middle income district stratum was composed of the 25 districts not categorized as low income or high income.

Table 2.1

NUMBER OF SCHOOLS IN THE POPULATION AND NUMBER OF SCHOOLS SELECTED FOR THE SAMPLE BY MAJOR SCHOOL STRATA AND AGE GROUP POPULATION

Major School Strata	Schools for Age 9			Schools for Age 13			Schools for Age 17		
	Number in Population	Number in Sample	Percent Selected	Number in Population	Number in Sample	Percent Selected	Number in Population	Number in Sample	Percent Selected
Non-Spanish Schools	1,293	50	4%	709	49	7%	252	51	20%
Spanish Schools	190	36	19%	99	31	31%	34	23	68%
Small Schools	220	11	5%	852	15	2%	265	4	2%
Total	1,703	97	6%	1,660	95	6%	551	78	14%

Substrata based on school size and racial composition were formed within the district income strata for each age group. The number of substrata formed for each district income stratum-age group combination are presented in Table 2.2.

Table 2.2

NUMBER OF SUBSTRATA BY AGE GROUP AND DISTRICT INCOME STRATUM

District Income Stratum	Number of Final Strata: Age Group		
	9	13	17
Low Income Stratum	3	2	3
Middle Income Stratum	4	5	5
High Income Stratum	5	5	5
Total Number of Strata	12	12	13

The sampling plan developed by RTI statisticians called for a sample of 50 schools for each age group from the non-Spanish major stratum. The school substrata were formed so as to assure a sample allocation of at least two schools in each of these strata as required by sampling error computation procedures. The sampling procedure used to select the schools from the non-Spanish stratum is termed "controlled selection". This procedure, which involved using a high speed computer, generated a large number of samples that contained at least one school from each school district and that were selected across the three age group populations; then a chance device was used to select one of these samples. RTI statisticians have had considerable experience with this method in designing and selecting samples for National Assessment.

2. Spanish School Stratification

For each age group, schools in the Spanish language, large school stratum were further stratified prior to sample selection. First, some schools at each age group were identified to be included in the sample with certainty because of their large estimated Spanish native language enrollments. These schools, included in the sample with probabilities equal to one, were termed the "self-representing" or "certainty" schools.

All Spanish language stratum schools which had not been classified as self-representing were stratified using estimated enrollments in each of the three pupil sampling groups (non-Black, English native language; Black,

English native language; Spanish native language) as the variables for classification. Thus, each of these substrata contained schools which were similar in student enrollment characteristics.

To the extent possible, the substrata were formed which were of approximately equal size in terms of "adjusted" total enrollment. The schools' "adjusted" enrollments were computed by multiplying the estimated enrollments in each of the three pupil sampling groups by appropriate oversampling rates, and then summing. Creation of approximately equal sized strata based on the adjusted enrollments assured that sampling weights for the selected pupils would be relatively uniform within each pupil sampling group.

The total number of sampling substrata formed within the Spanish language major stratum was 16 for the 9-year-old age group, nine for the 13-year-old age group, and four for the 17-year-old age group. In general, two sample schools were allocated to each substratum, and the schools were selected with equal probabilities without replacement.

3. Small School Stratification

The small school substrata were also formed to include schools with similar characteristics. Thus, schools were placed into the same situation if their ethnic compositions and total number of students were similar. The total number of substrata for the 9-, 13-, and 17-year-old age groups were 9, 12, and 2, respectively. The small school sample was selected from 21 small districts which appeared to have 20 or fewer eligible students in some of their schools, and 9 other small schools were chosen from the balance of the small school sampling frame by using equal probability sampling without replacement.

C. Description of the Student Sample

The student sample involved the selection of a stratified random sample of students from each sample school. Each sample school provided a list of all eligible students in the age group populations being assessed. The schools had assigned each eligible student in the sampling frame to one of the following three groups of students:

Group I	Spanish Native Language
Group II	Black
Group III	Remainder (termed "English").

Using this information, RTI statisticians designed and selected a stratified random sample for each school using an allocation procedure that met the statistical precision requirement specified by the FDOE. In order to achieve the precision of estimation specified by the FDOE, RTI statisticians estimated that a total student sample of approximately 1,600 would be required for each age group, and that the sample sizes for the major subpopulations should be as specified in Table 2.3.

Table 2.3

PLANNED STUDENT SAMPLE SIZES BY THE MAJOR SUBPOPULATIONS FOR ALL AGE GROUPS

Student Subpopulation	Planned Sample Size for All Age Groups
Non-Black, English Native Language	500
Black, English Native Language	500
Spanish Native Language	600
Total Student Sample	1,600

Since approximately equal-sized samples were required for each of three major student subpopulations which differed significantly in size, it was necessary to oversample the Black and Spanish native language subpopulations to achieve the desired sample sizes for these groups. Oversampling was accomplished through the use of differential sampling rates to select the students within schools.

The planned student sample size per school was 20 in all but 15 schools. Forty students were selected from seven schools in the 13-year-old school sample, and 40, 60, and 140 students were selected from five, two, and one school(s), respectively, in the seventeen-year-old sample. The larger sample sizes from certain schools in these two age groups were necessary to insure that equal statistical precision would be obtained for results of the three ethnic groups. The total number of sample students selected by age group and subpopulation is presented in Table 2.4.

Table 2.4

ACTUAL STUDENT SAMPLE SIZES BY THE MAJOR SUBPOPULATIONS AND BY AGE GROUP

Student Subpopulation	Age Group 9	13	17
	(number selected)		
Non-Black, English Native Language	629	623	548
Black, English Native Language	572	459	547
Spanish Native Language	557	632	660
Total Student Sample	1,758[1/]	1,714	1,755[2/]

[1/] This sample size includes students from a special supplemental school sample composed of 12 small school districts.

[2/] This sample size includes students from a special supplemental school sample composed of 12 small school districts, but it does not include the intended student sample in one school which refused to participate.

D. Participation Rates of the School and Student Samples

The participation rates for the sample schools were excellent. Only one of the 259 total sample schools that contained eligible students did not participate. The participation rate for the selected students in the age 9 and age 13 samples was 88 percent, which is below the expected rate of 93 percent. RTI has experienced the latter rate in several educational assessments of this nature in other states. Participation for the 17-year-old sample was not as good as that for the other age group samples; only 80 percent of the selected 17-year-old students participated. RTI has generally experienced an 85 percent participation rate with other samples of this age group. Participation data on schools and students are presented in detail in the section on data collection.

III. INSTRUMENTATION AND SCORING

After the sample design had been decided upon, the next task was to develop the reading and mathematics assessment instruments for each age group. The decision was made to package the reading and mathematics items separately. Thus, two assessment booklets were administered to each sample of 9-, 13-, and 17-year-olds.

The first part of the reading assessment booklet contained the items and the second part consisted of a seven-item Student Questionnaire.

Instrument development was accomplished through the following three steps, which are discussed in the subsequent sections: selection of assessment items, selection of School and Student Questionnaire items, and assembly of assessment booklets.

A. Selection of Assessment Items

In August of 1974, a conference was held with staff from FDOE and RTI to select the reading and mathematics items best suited to the objectives of the Florida National Assessment Replication. The meeting of the mathematics item selection committee on August 16 was followed by a meeting of the reading item selection committee on August 17. The members of the mathematics item selection committee were: Dr. Thomas Denmark, Professor of Mathematics Education at Florida State University, Ms. Renee Henry, FDOE Mathematics Consultant, and Dr. Kenneth Loewe, FDOE Evaluation Consultant. The reading item selection committee members were: Dr. Martha Cheek, FDOE Reading Consultant, and Dr. Kenneth Loewe, FDOE Evaluation Consultant. Dr. David Bayless, RTI Educational Sampling Statistician, Mr. Larry Conaway, RTI Educational Research Scientist, and Dr. Wayne Martin of the National Assessment of Educational Progress served as resource consultants for both selection committees.

It had been concluded prior to the conference that the National Assessment released reading and mathematics item pools would provide the best vehicle for comparison of Florida's student performance with the nation's. The selection committees first eliminated from the NAEP released item pools those items with obvious construction or formatting problems. Some of the remaining items had to be eliminated in order to meet design constraints associated with costs and maximum testing time for each student. The total administration time limit for reading and mathematics was 90 minutes for 9-year-olds, 120 minutes for 13-year-olds, and 120 minutes for 17-year-olds. Both committees established item selection criteria related to reading and mathematics content in selecting the items to be included in the assessment at each age.

The reading selection committee placed emphasis on items from themes 5 through 8 (gleaning significant facts from passages, main ideas and organization, drawing inferences, and critical reading). Items were eliminated that

could readily be answered through a process of eliminating response choices, that were mastered at a younger age level, that were regional in concept or vocabulary, or that did not appear to measure the theme in which they were placed by NAEP. The results of the reading item selection for each age group by administration time and type of item are given in Table 2.5. The Florida reading items for each age group are identified by NAEP themes in Table 2.6.

The mathematics group selected items that measure skills important for Florida 9-, 13-, and 17-year-old students and that are the most appropriate for these students. Mathematics items were rejected when they appeared to be inappropriate for Florida students at a particular age level, or when a younger age group had achieved a very high level of performance on the same item. The results of the mathematics item selection for each age group by administration time and type of item are given in Table 2.7. The Florida mathematics items are identified by NAEP content areas for each age group in Table 2.8.

In the selection process both committees considered item difficulty level relative to the age group and attempted to insure coverage of those themes and content areas that were best suited to the needs of the Florida Assessment. Within the constraints of cost and design factors associated with the assessment, both committees also considered balance across item difficulty levels and balance between multiple choice and open-ended items.

Table 2.5

RESULTS OF READING ITEM SELECTION
BY ADMINISTRATION TIME AND ITEM TYPE

Results by Administration Time	
Age Group	Time in Minutes
9	59
13	61
17	51
Total	171

Results by Item Type			
Age Group	Number of Multiple Choice Items	Number of Open-Ended Items	Total Number of Items
9	42	8	50
13	49	13	62
17	54	7	61
Total	145	28	173

Table 2.6

FLORIDA ASSESSMENT READING ITEMS
BY NATIONAL ASSESSMENT READING THEMES
FOR ALL THREE AGE GROUPS

Reading Theme and Subtheme	Reading Items Classified by NAEP Theme[1]		
	Age 9	Age 13	Age 17
1. Understanding Word Meanings			
In isolation In context	1, 11A, 11B	2, 10, 22B	2, 19C
2. Reading and Visual Aids			
Interpreting drawings and pictures Reading signs and labels Reading charts, maps, and graphs	4, 8, 10A, 10B, 10C, 10D, 10E, 14, 20, 23, 25	1, 3A, 3B, 3C, 5, 7, 12A, 12B, 16A, 16B, 16C, 16D, 16E, 25, 28, 30	3A, 3B, 3C, 10, 11A, 11B, 11C, 13A, 13B, 13C, 13D, 13E, 18A, 18B
3. Following Written Directions			
Understanding written directions Carrying out written directions	18A, 18B, 18C, 18D	8A, 8B, 8C, 13A, 13B, 24A, 24B, 24C, 24D, 24E	7A, 7B, 7C
4. Reading and Reference Materials			
Knowledge of source Use of reference materials	3A, 3B, 3C, 3D, 3E, 5, 22	9A, 9B, 9C, 9D, 9E, 14, 19A, 19B, 23	1A, 1B, 9A, 9B, 9C, 9D, 9E, 21, 23A, 23B, 23C
5. Reading for Significant Facts			
Recognizing factual information Retaining factual information Understanding relationships among facts	9A, 13C, 16A, 19B, 21, 24C	4A, 4B, 15A, 15B, 15C, 17B, 20A, 20B, 20C, 20D, 22A, 27B	4A, 4B, 5A, 5B, 12A, 12B, 12C, 15B, 17A, 17B, 17C, 17D, 22B

Table 2.6 (Continued)

Reading Theme and Subtheme	Reading Items Classified by NAEP Theme[1]		
	Age 9	Age 13	Age 17
6. Reading for Main Ideas and Organization			
Reading for main ideas Recognizing a topic Recognizing a central thought	2B, 7, 13A, 13B, 17, 19A	4C, 11, 27A	4C, 15A, 16, 22A, 24A, 24C
7. Reading and Drawing Inferences			
Drawing inferences from information given Drawing inferences from information given plus additional knowledge	2A, 6, 13D, 16B, 16C, 26	6, 26, 27C, 29	4D, 6, 19A, 19B, 19D, 22C, 24B
8. Critical Reading			
Understanding literary devices Recognizing mood and tone Discriminating fact from opinion Understanding author's purpose Recognizing and evaluating sources	9B, 12, 15A, 15B, 24A, 24B, 24D	17A, 18A, 18B, 18C, 21	8A, 8B, 8C, 14, 20

[1] In the table, reading items are classified by theme and not by subtheme since analysis is based on theme.

Table 2.7

RESULTS OF MATHEMATICS ITEM SELECTION
BY ADMINISTRATION TIME AND ITEM TYPE

Results by Administration Time	
Age Group	Time in Minutes
9	34
13	58
17	62
Total	154

Results by Item Type			
Age Group	Number of Multiple Choice Items	Number of Open-Ended Items	Total Number of Items
9	22	33	55
13	21	53	74
17	23	55	78
Total	66	141	207

Table 2.8

FLORIDA ASSESSMENT MATHEMATICS ITEMS
BY NATIONAL ASSESSMENT CONTENT AREAS
FOR ALL THREE AGE GROUPS

Mathematics Content Areas	Mathematics Items Classified by NAEP Content Areas[1/]		
	Age 9	Age 13	Age 17
A. Number and Numeration Concepts			
Numeration systems Number systems	6, 15, 20, 22A, 22B, 22C, 22D, 26, 35, 37	4, 9, 25, 32, 34, 62	4, 26, 40, 69
B. Properties of Numbers and Operations			
Whole numbers Rational numbers	12A, 12B, 12C, 14, 27, 40A, 40B, 42	12, 29, 37, 44A, 44B, 51, 54	12, 14, 18, 51, 61
C. Arithmetic Computation			
Whole numbers Rational numbers Ratio, proportion, and percent Rounding off	2, 3, 5, 10, 16, 18, 24, 28, 30A, 30B, 30C, 30D, 32, 34, 38	2, 5, 7, 10, 14, 19A, 19B, 22, 24, 27A, 27B, 27C, 27D, 38, 41, 43A, 43B, 47, 50, 55, 65	10, 15, 17A, 17B, 17C, 17D, 19, 24, 27, 31, 32, 41, 42A, 42B, 45, 47, 52, 54, 63A, 63B, 71
D. Sets			
Properties Operations and relationships		20, 45, 64	3, 9, 34
E. Estimation and Measurement			
Standard units Conversion relations	4, 9, 21, 33, 36, 43	1, 3, 13, 16, 21, 30, 36, 57	1, 6, 29, 33, 37, 58

Table 2.8 (Continued)

Mathematics Content Areas	Mathematics Items Classified by NAEP Content Areas[1/]		
	Age 9	Age 13	Age 17
F. Exponents and Logarithms			
Exponential and logarithmic equations		11, 17, 40, 60	11, 20, 22, 35, 56
Manipulation of radicals			
Scientific notation			
G. Aglebraic Expressions			
Properties of expressions (variables, constants, and order of operations)		26, 39	5, 55, 57, 64, 70
Monomials and polynomials			
Manipulation of expressions			
Evaluating expressions			
H. Equations and Inequalities			
Linear equations and inequalities	1, 19	6, 8, 46, 63, 67	2, 7, 13, 30, 46
Higher degree equations and inequalities			
Graphic interpretation of equations and inequalities			
I. Functions			
Definition of a function			16, 66
Functional notation			
Linear functions and their graphs			

Table 2.8 (Continued)

Mathematics Content Areas	Mathematics Items Classified by NAEP Content Areas[1]		
	Age 9	Age 13	Age 17
J. Probability and Statistics			
Basic probability concepts Descriptive statistics		18, 31, 48, 58	21, 25, 38, 53
K. Geometry			
Points, lines, and planes Polygons and polyhedra Circles and spheres Metric geometry Geometric constructions	7, 11, 13, 17, 23, 25, 29, 31, 39, 41, 44	15, 23, 33, 49, 56, 61, 66	23, 43, 44, 50, 65
N. Logic		35, 42	36, 49
P. Business and Consumer Mathematics			
Buying Personal finance Income from commissions Taxes Attitude and interest items		52, 59	8, 48, 60, 62, 67
Q. Charts and Graphs	8A, 8B, 8C	28A, 28B, 53	28, 39A, 39B, 59A, 59B, 68

[1] In the table, mathematics items are classified by Content Area objectives and not by Content Area subobjectives since analysis is based on Content Area.

B. Selection of Student and School Questionnaire Items

It was decided that the questionnaire items utilized in the National Assessment would provide the demographic and background data sufficient for analysis while staying within allotted administration time limits and personal privacy constraints. Furthermore, the use of NAEP items assured comparability between Florida and NAEP reporting variables and reporting groups.[1/] The seven-item Student Questionnaire was duplicated using NAEP wording and format at the end of the reading assessment booklet. The data obtained from these items were used in defining three of the six reporting variables: Sex, Reading Materials in the Home, and Parents' Education. The School Questionnaire was sent to the principals of the sample schools for completion. The data from two of the items was used in defining the reporting variable Size and Type of Community. The remaining two reporting variables, Race and Spanish as a Native Language, were obtained from data gridded on the assessment booklet covers.[2/]

C. Assembly of Assessment Booklets

After item selection had been completed by the committee members, and the decision to use NAEP Student Questionnaire items had been made, the reading and mathematics items were assembled into six assessment booklets (one reading and one mathematics for each of the three age groups) by RTI personnel experienced in packaging NAEP materials. The total number of items and the amount of space needed for mathematics items necessitated two machine scorable booklets at each age level. One booklet contained reading items with sample exercises and the other mathematics items with sample exercises. The Student Questionnaire was placed at the end of the reading booklet.

The packaging was accomplished in close cooperation with MRC who would print and score the booklets as it had done for NAEP. It was important that the format for the items be as nearly identical as possible and practical with the format used by NAEP, that the sequence of items be appropriate, and that the answer marking and scoring areas be formatted to minimize student errors. To insure that these requirements were met, the booklets were reviewed by RTI and NAEP

1/ Reporting variables and groups are described in Appendix A-1.

2/ The coding of supplemental data on assessment covers is described further in the section on data collection.

personnel prior to administration. RTI was primarily responsible for spacing the items so that adequate working area was available and for ordering the items in the booklet on the basis of their content and their difficulty levels. Packaging of reading items did not pose any problems; however, because of the quantity of mathematics items, the spacing of some open-ended mathematics items had to be changed. The degree to which spacing within an item is changed could adversely affect student performance; therefore, RTI had the mathematics booklets carefully reviewed by both NAEP and MRC staff members involved in the scoring process. NAEP staff members also checked the ordering of mathematics items for answer cueing in items placed consecutively in the booklet for each of the three age groups.

A paced audio tape was created to accompany each booklet. Students were to respond to each item within the time provided on the tape. The response times for both reading and mathematics items were carefully set to be comparable to those used in NAEP administrations. At the 9-year-old age level there was a break during the administration of the reading booklet and between administration of the reading and mathematics booklets. There was no break during the administration of the mathematics booklet since there were only 30 minutes of items. At the 13- and 17-year-old age levels, a break occurred only between reading and mathematics administrations.

After the preliminary checks of booklets and tapes had been completed by RTI, NAEP, and MRC staff, the 13-year-old reading and mathematics booklets were field-tested by RTI Survey Specialists. Several students were asked to give their opinions on the space for working out answers, the length of response time, the clarity of the instructions, and the legibility of the printed material. Because no major problems were encountered, no field tests of the 9- and 17-year-old booklets and tapes were conducted.

D. Scoring

The Measurement Research Center was responsible for scoring the assessment booklets. Special precautions were taken to assure that the error rate for categorization was no higher than that for the original NAEP scoring. NAEP staff assisted RTI and MRC in setting up the scoring process; the NAEP scoring categories were well-defined; and MRC staff experienced in NAEP scoring procedures scored the Florida assessment items.

Students marked responses to both multiple choice items and to open-ended items directly in the booklets. After the scorers marked scoring categories for each open-ended item in a student's booklet, both the multiple choice responses and scoring categories were optically scanned, the information was placed on a data tape, and the data tape was sent to RTI for analysis. MRC created a data tape with one record for each student. This record included the student's responses to each of the assessment and Student Questionnaire items, information collected from school officials about the student's school or community, and student identification information. The student's name did not appear on the tape. The data tape for each age was then sent to RTI to be merged with student weight information in preparation for data analysis.

IV. DATA COLLECTION

A. Introduction

From August 20, 1974, to April 8, 1975, RTI Survey Specialists in the Survey Methodology and Operations Department (SMOD) developed methodological materials and supervised field operations for the Florida National Assessment Replication. They were responsible for preparation of materials used in briefing Florida school personnel on the assessment, development of training manuals and procedures, and receipt and final edit of data collection instruments. To insure the comparability of Florida assessment data with National Assessment data, SMOD duplicated, to the extent possible, NAEP administrative procedures and conducted the assessment during the same time periods in which the National Assessment was conducted. The basic tasks related to preliminary preparation, training of District Coordinators, data collection, and check-in and edit procedures were identical for each age group. Table 2.9 presents an overview of the time frame for these tasks and specifies within each task the dates and purposes of each event.

B. Preliminary Preparation

Between August 20, 1974, and October 17, 1974, Survey Specialists made preparations for field data collection in the sample schools. After data

Table 2.9

TIME FRAME FOR DATA COLLECTION

I. Preliminary Preparation

Age Level	Date	Event	Purpose
(13) (9) (17)	August 20 - October 15, 1974 November 15 - December 10, 1975 January 5 - February 4, 1975	Development of field data collection system (using NAEP as a model) that could be easily followed and adhered to by District Coordinators and School Administrators	To insure accurateness and completeness of data, as well as comparability between NAEP and the Florida assessment
(13) (9) (17)	September 1 - October 1, 1974 December 15 - January 5, 1975 February 5 - 10, 1975	Development of letters for initial contact with sample school superintendents, principals, and District Coordinators	To describe the objectives of the Florida assessment, outline the role of district and school personnel, and present the time frame established by RTI and OE for data collection
(13) (9) (17)	September 5 - October 14, 1974 December 15 - January 5, 1975 January 15 - February 5, 1975	Development of cassette tapes, training manuals, and special handouts for use in field work	To prepare for the training of District Coordinators by RTI and FDOE and to provide sufficient time for review of materials by FDOE staff
(13)	October 17, 1974	Field test of 13-year-old reading and mathematics assessment booklets and administration procedures	To insure that adequate time had been allowed for assessment items and to detect any problems that might exist in administration procedures

II. Training of District Coordinators

Age Level	Date	Event	Purpose
(13) (9) (17)	November 12 - 22, 1974 January 13 - 24, 1974 and March 3 - 7, 1974	Training of District Coordinators at various sites in Florida	To review with District Coordinators all aspects of data collection so that administration procedures at each age level would be fully understood

III. Data Collection

Age Level	Date	Event	Purpose
(13) (9) (17)	December 2 - 6, 1974 January 15 - 28, 1975 March 3 - 14, 1975	Initiation of data collection activities with the Administration of Reading and Mathematics assessment booklets	To obtain the data needed for analysis
(13) (9) (17)	December 9 - 10, 1974 January 27 - 28, 1975 March 17 - 18, 1975	Administration of assessment booklets to sample students missing first administration	To insure that assessment data was as complete as possible
(13) (9) (17)	December 10, 1974 January 29, 1975 March 18, 1975	Return of all assessment materials and completed data forms to RTI	To enable the final edit of all assessment materials by RTI Survey Specialists

IV. Check-In and Edit Procedures

Age Level	Date	Event	Purpose
(13) (9) (17)	December 10 - 13, 1974 January 29 - February 10, 1975 March 18 - April 8, 1975	Receipt and final edit of reading and mathematics assessment booklets and School Questionnaires	To insure completeness and accuracy of data prior to shipment to NRC
(13) (9) (17)	January 2 - 4, 1975 February 6 - 10, 1975 March 28 - April 8, 1975	Shipment of assessment booklets and School Questionnaires to NRC for scoring	To prepare for data analysis

collection activities had been planned and schedules developed, SMOD mailed letters of introduction to district superintendents, District Coordinators, and school principals of sample schools. These letters described the role of the school and its personnel in the assessment and requested a listing of all students eligible for the assessment in each sample school be compiled and returned to RTI. Upon receipt of these lists, RTI Sampling Statisticians selected the student sample and provided SMOD with computerized listing forms of the sample students by sample school.

Next in the schedule of activities was the development of two manuals, one for use by RTI Survey Specialists in training District Coordinators and another for use by District Coordinators in training School Administrators. These manuals were designed to familiarize District Coordinators and School Administrators with proper administrative procedures related to activities prior to, during, and after assessment booklet administration for all three age levels. (Instructions specific to each age group supplemented the general instructions.) As mentioned previously, the majority of these procedures were identical to those used by NAEP; however, others were devised specifically for the Florida assessment.

Prior to the training of District Coordinators and School Administrators, RTI Survey Specialists conducted a trial administration of 13-year-old assessment booklets and audio tapes in a Durham, N.C., junior high school to verify that administration procedures were adequate and to detect any major problems that might exist. Based upon the successful results of this administration, the FDOE approved the initiation of assessment activities within the schools.

C. Training of District Coordinators

During November, 1974, RTI Survey Specialists with the help of FDOE personnel, conducted a series of training sessions for District Coordinators. The purpose of the training was to provide District Coordinators with an overview of assessment proceedings and a thorough understanding of data collection procedures. The District Coordinators were responsible for training persons selected as School Administrators in sample schools. At these sessions, District Coordinators were provided with two types of materials:

1) manuals for training School Administrators

2) reading and mathematics assessment booklets, paced cassette tapes, pencils, and other materials needed by School Administrators to conduct the assessment at the 13-year-old level.

Procedures to be used in training School Administrators, contacting sample schools, and disbursing and collecting assessment materials were discussed in detail. Both the District Coordinator's Manual and the School Administrator's Manual were reviewed with emphasis being placed on the following:

1) School Questionnaire: The School Administrators were to be encouraged to ask for the School Questionnaires and check for completeness prior to leaving the schools.
2) Student Identification: The correct procedure for matching assessment booklet ID numbers with student names and ID numbers on the Student Listing Forms was demonstrated. The necessity of determining and recording reasons for non-participation was pointed out. District Coordinators were reminded to have the list of names detached from the computer forms and delivered to the principal before leaving the school to insure student anonymity.
3) Assessment Booklet Administration: District Coordinators were instructed in the proper techniques for introducing and distributing assessment booklets and in methods of coping with any problems that should arise. Proper use of cassette tapes with regard to the paced-tape administration was demonstrated. Rules were established concerning the extent to which students could be assisted during the administration. Careful monitoring was stressed to insure proper completion of booklets.
4) Editing Procedures: The necessity of an accurate preliminary edit of all assessment booklets and School Questionnaires was explained. Specific requirements for assessment booklet edits included scanning each item to check if a response was made, recording incomplete item entries and the reasons for incompletion on the booklet covers, and gridding data on the booklet covers from the computer listing forms.

D. Assessment Booklet Administration

RTI Survey Specialists did not participate in the actual assessment booklet administration, but they did monitor the receipt of assessment materials by District Coordinators and School Administrators and the return of these materials

to RTI. A receipt/return card system was used to make sure that the established deadlines were met.

Assessment sessions were conducted by School Administrators between November 12, 1974 and March 18, 1975. Make-up sessions were conducted for those students missing the first assessment booklet administration. After the last make-up session, School Administrators began the check-in and edit of assessment instruments.

E. Check-In and Edit Procedures

Check-in instructions were written and a system was devised for School Administrators to check-in, edit, and account for every complete and incomplete student booklet and School Questionnaire. Incorporated in this system was a method for documenting problems and reasons for student non-participation. School Administrators then sent all assessment booklets, questionnaires, tapes, edit forms, and other materials to the District Coordinators who were responsible for mailing them to RTI. At RTI survey clerks re-edited each editing procedure made on assessment booklets and questionnaires by the School Administrators. An edit was also performed to verify agreement between information gridded in the booklet covers and that on the student listing forms. If data were found to be missing or inaccurate (e.g., improperly gridded booklet covers), RTI staff contacted FDOE staff who obtained the correct information from the schools. As the editing was completed for each school, a check-in sheet was entered in the editor's notebook, and the booklets were shipped to MRC for scoring.

F. Participation Data

The original sample contained a total of 282 schools for all three age groups. Twenty-three of these schools (8.2%) were found to have no eligible students in the age group that these schools were selected to represent, and one sample school (0.4%) refused to participate. The assessment booklets and Student Questionnaires were administered in the remaining 258 schools (91.5% of the original sample).

From the 258 schools, 5227 students were selected to participate in both the reading and mathematics assessments. The total numbers who participated were 4458 (85.3%) for reading and 4440 (84.9%) for mathematics. The most common reasons for non-participation in both assessments were absenteeism and withdrawal

or transfer. Of the 769 reading nonparticipants (100%), 395 students (51.4%) were absent; 21 students (2.7%) refused to participate in the assessment; 36 students (4.7%) were ineligible due to their dates of birth; 226 students (29.4%) had withdrawn or transferred; 22 students (2.9%) had conflicting activities; 22 students (2.9%) were non-readers; and 47 students (6.1%) did not participate for other reasons. Of the 786 mathematics nonparticipants (100%), 393 students (50.0%) were absent; 23 students (2.9%) refused; 36 students (4.6%) were ineligible due to their dates of birth; 228 students (29.0%) had withdrawn or transferred; 22 students (2.8%) were non-readers; and 61 students (7.8%) did not participate for other reasons.

Table 2.10 presents the participation data for sample schools by age group and for sample students by age group and subject area.

V. SUMMARY OF DATA ANALYSIS

The major purpose of this report is to describe the reading and mathematics performance of Florida 9-, 13-, and 17-year-old students. National Assessment reading and mathematics items, selected for their relevance to Florida's educational objectives, were administered to probability samples of Florida students at each of the three age levels, utilizing procedures to assure basic comparability with NAEP results.

This report points out differences in reading and mathematics performance between Florida's students, the nation's students, and the Southeast's students; it also points out differences in performance between subgroups of Florida students and corresponding subgroups of the nation's students, categorized by sex, race, level of parental education, and size and type of community. In addition, the appendices of this report present the results for the differences between these same groups when the distributions of some other relevant variables are statistically adjusted so that their distributions are the same for the groups. These adjusted, or balanced, results are presented to assist in explaining the differences that are observed. This report also presents reading and mathematics performance differences between Florida students, categorized by sex, race, level of parental education, size and type of community, reading materials available in the home, and Spanish as a native language.

Table 2.10

PARTICIPATION DATA

PARTICIPATION OF SAMPLE SCHOOLS

Age Group	Sample Schools Initially Selected		Sample Schools Refusing		Sample Schools With No Eligible Students		Sample Schools With Eligible Students		Sample Schools Participating	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
9	104	100%	0	0.0 %	7	6.7%	97	93.3%	97	100%
13	95	100%	0	0.0 %	12	12.6%	83	87.4%	83	100%
17	83	100%	1	1.2 %	4	4.8%	78	94.0%	78	100%
Total	282	100%	1	0.4%	23	8.2%	258	91.5%	258	100%

STUDENT PARTICIPATION RATES

Subject Area	Age Group	Sample Students Selected		Sample Students Participating		Sample Students Not Participating	
		Number	Percent	Number	Percent	Number	Percent
Reading	9	1758	100%	1547	88.0%	211	12.0%
	13	1714	100%	1503	87.7%	211	12.3%
	17	1755	100%	1408	80.2%	347	19.8%
Total		5227	100%	4458	85.3%	769	14.7%
Mathematics	9	1758	100%	1543	87.8%	215	12.2%
	13	1714	100%	1489	86.9%	225	13.1%
	17	1755	100%	1408	80.2%	347	19.8%
Total		5227	100%	4440	84.9%	787	15.0%

STUDENT NON-PARTICIPATION RATES[1/]

Subject Area	Age Level	Reasons for Non-Participation by Students														Total	
		Absenteeism		Refusal		Ineligibility		Withdrawal or Transfer		Conflicting Activities		Non-Reader		Other			
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Reading	9	85	40.3%	0	0.0%	17	8.1%	65	30.8%	4	1.9%	15	7.1%	25	11.9%	211	100%
	13	96	45.5%	7	3.3%	13	6.2%	76	36.0%	3	1.4%	5	2.4%	11	5.2%	211	100%
	17	214	61.7%	14	4.0%	6	1.7%	85	24.5%	15	4.3%	2	0.6%	11	3.2%	347	100%
Total		395	51.4%	21	2.7%	36	4.7%	226	29.4%	22	2.9%	22	2.9%	47	6.1%	769	100%
Mathematics	9	86	40.0%	0	0.0%	17	7.9%	65	30.2%	4	1.9%	15	7.0%	27	12.1%	214	100%
	13	96	42.7	7	3.1%	13	5.8%	78	34.7%	4	1.8%	5	2.2%	22	9.8%	225	100%
	17	211	60.8%	16	4.6%	6	1.7%	85	24.5%	15	4.3%	2	0.6%	12	3.5%	347	100%
Total		393	50.0%	23	2.9%	36	4.6%	228	29.0%	23	2.9%	22	2.8%	61	7.8%	786	100%

[1/] The percents are based on the total number of non-participants.

The differences presented in this report are those which are statistically significant at the .05 level. This means that a sample difference of this magnitude can be expected to occur in repeated samplings only five times in a hundred if the actual difference is zero. While these results very likely reflect actual performance differences between groups, they provide no information about the causes of these differences. For example, it may be that students who live in large communities perform above the state performance level, but this does not necessarily mean that living in large communities causes higher performance. The reader is further cautioned not to equate statistical significance and practical importance. Just as educators and the lay public must establish acceptable levels of performance for the state as a whole, they must also determine which of these statistically significant differences have educational or social significance. Once critical problems are identified, further research and thought will be needed to explore causality and to determine policies and patterns of resource allocation necessary to resolve these problems.

The FLOE has taken initial steps to help insure that the assessment results and reports provide information which can be interpreted and utilized by Florida educators and the lay public. Interpretive writers, who are both skilled in the reading and mathematics subject areas and attuned to the objectives and procedures of Florida education, will interpret the assessment results presented in this report. This report and the interpretive report will be available for further analysis and interpretation by those interested in determining needs and improving instruction in reading and mathematics.

Chapter 3

The Relationship Between Reporting Variables and the Performance of 9-, 13-, and 17-Year-Olds in Reading and Mathematics

I. INTRODUCTION

When assessment data on student reading and mathematics performance were collected in Florida, supplemental information about sample students and the schools they attended was also obtained. Each participating sample student completed a questionnaire concerning his sex, the educational levels of his parents, and the availability of various reading materials in the home. In addition, school officials obtained race and native language data for each student. In each participating sample school, the principal completed a questionnaire providing information on the size and type of community in which the sample school was located.

This information was used to form the six reporting variables by which results are presented for the within Florida analysis of reading and mathematics performance data: Sex, Race, Size and Type of Community, Parents' Education, Reading Materials in Home, and Spanish as a Native Language. For the purpose of reporting results, these variables were classified into subcategories which are called reporting groups. For instance, Sex is a reporting variable which is divided into two reporting groups, males and females. For the Florida National Assessment Replication, Sex, Race, Size and Type of Community, and Parents' Education were selected and defined according to National Assessment specifications so that Florida results could be compared with national results. National Assessment did not report Reading Materials in the Home or Spanish as a Native Language; therefore, these reporting variables were defined according to FDOE specifications. Appendix A-1 of this report contains the definitions of all reporting variables and reporting groups used in the presentation of the within Florida results.

This chapter compares reading and mathematics performance between students classified by reporting groups and students in the state as a whole.

The results are discussed in terms of statistically significant group effects occurring in item aggregates (clusters of items) that have been defined for each subject area at each of the three age levels.[1/] A group effect was calculated for each reporting group by subtracting the average cluster percent correct of the state from that of the reporting group. An effect, or difference, was labeled statistically significant (at the .05 level of confidence) if it was at least twice as large as its associated standard error. In the tables for this chapter,[2/] statistical significance is denoted by an asterisk to the right of the effect, or difference. Thus, a negative group effect with an asterisk indicates that the performance of students in the particular reporting group was significantly below the Florida average cluster percent correct,[3/] while a positive group effect with an asterisk indicates that the performance of students in the particular reporting group was significantly above the Florida performance level.

Some rather large effects are sometimes not statistically significant, while some rather small effects are in some instances statistically significant. This is due to the fact that statistical significance is determined by the ratio of the effect to its standard error. In general, items that are based upon large samples have smaller standard errors. These item standard errors are used to calculate standard errors for the average percents of items answered correctly. If a standard error associated with an effect is very large, even a large effect may not be statistically significant. On the other hand, if a standard error of an effect is very small, a small effect may be statistically significant.

1/ A listing of the items contained in each reading cluster can be found for each age level in Appendices B-4, D-4, and F-4. A listing of the items classified in each mathematics cluster can be found for each age level in Appendices C-4, E-4, and G-4. Clusters for each subject area were defined on the basis of the National Assessment reading themes and mathematics content areas. The reading themes and content areas are listed in Chapter 2 of this report.

2/ The reading cluster results in these tables are from data in detached Appendices B-4, D-4, and F-4. The mathematics cluster results in these tables are from data in detached Appendices C-4, E-4, and G-4.

3/ Throughout the chapter, the following terms are used interchangeably for average cluster state percent correct: state average percent correct, state performance level, and performance of students in the state.

General cautions to be exercised in the interpretation of results have been previously mentioned in the data analysis section of Chapter 2; however, it is essential that the reader be aware of cautions specifically related to the results presented in this chapter. Item clusters containing less than three items do not usually provide a sufficient measure of performance for that cluster; therefore, statistical significance on a reporting group for such a cluster may be misleading and merits cautious interpretation.[1/] Student performance on the item clusters presented in this chapter should not be compared across age levels. Although the majority of the item clusters exist for the same reading themes and mathematics content areas at each age level, the items contained in these aggregates are not generally the same across age levels. Chapter 4 will discuss differences in reporting group performance across age levels on item clusters composed of the same items.

In sections II through VII of this chapter, the relationships between each reporting variable and the performance of Florida students on item clusters in reading and mathematics at all three age levels are discussed. Section VIII presents a summary of these results across reporting variables.

II. THE RELATIONSHIP BETWEEN SEX AND THE PERFORMANCE OF 9-, 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

The variable Sex has two reporting groups: males and females. The necessary information was provided by the student and verified by the School Administrators.

A. The Relationship Between Sex and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.1 presents the group effects (differences) by age level for the Sex reporting groups in the subject area of reading. In the subsequent sections,

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1/ In the tables in this chapter, the number of items for each reading theme and mathematics content area is provided.

Table 3.1

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SEX REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes								Total Reading
	Word Meanings	Visual Aids	Following Directions	Reference Materials	Significant Facts	Main Ideas	Drawing Inferences	Critical Reading	
	1	2	3	4	5	6	7	8	
State Average % Correct									
Age 9	79.8 (3)[1/]	74.6 (11)	81.3 (4)	41.3 (7)	60.3 (6)	66.0 (6)	65.9 (6)	37.0 (7)	64.5 (50)
Age 13	81.5 (3)	78.8 (16)	82.8 (10)	77.6 (9)	81.7 (12)	61.3 (3)	81.5 (4)	64.0 (5)	78.1 (62)
Age 17	54.7 (2)	78.6 (14)	66.0 (3)	85.1 (11)	88.6 (13)	81.8 (6)	75.9 (7)	67.6 (5)	79.6 (61)
Group Effects: Males									
Age 9	-3.0*	-1.1*	-2.6*	-3.5*	-3.5*	-4.4*	-4.2*	-3.1*	-3.0*
Age 13	-1.9*	-0.3	-2.4*	-2.5*	-2.9*	-2.3*	-2.6*	-1.9*	-1.9*
Age 17	-5.3*	-1.0*	-6.2*	-2.2*	-3.4*	-3.8*	-3.0*	-2.7	-2.8*
Group Effects: Females									
Age 9	3.6*	1.4	3.1*	4.2*	4.2*	5.2*	5.1*	3.7*	3.6*
Age 13	2.1*	0.4	2.7*	2.8*	3.3*	2.6*	2.9*	2.1*	2.2*
Age 17	5.5*	1.0*	6.1*	2.1*	3.3*	3.8*	3.0*	2.6	2.7*

1/ The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

student performance on the eight reading themes will be discussed by age level and within each age level by males and females.

1. The Relationship Between Sex and the Performance of 9-Year-Olds in Reading

Nine-year-old male students performed significantly below the state performance levels on every reading theme and on total reading. Nine-year-old female students significantly outperformed students in the state on total reading and on all themes except Theme 2 (Visual Aids).

2. The Relationship Between Sex and the Performance of 13-Year-Olds in Reading

On total reading and on every theme except Theme 2 (Visual Aids), 13-year-old male students scored significantly below students in the state while 13-year-old female students scored significantly above students in the state. The differences in the seven themes, although statistically significant, were generally not very large in magnitude for either reporting group.

3. The Relationship Between Sex and the Performance of 17-Year-Olds in Reading

On total reading and on every theme except Theme 8 (Critical Reading), 17-year-old male students performed significantly below state performance levels, while 17-year-old female students performed significantly above state performance levels. The differences within each of the eight themes for males and females were almost identical in magnitude.

4. Summary: Sex and Reading Performance

The relationship between Sex and the reading performance of 9-, 13-, and 17-year-olds was quite similar for each of the reporting groups. Across all three age levels in total reading, male students performed significantly below the state performance level, and female students performed significantly above the state performance level.

B. The Relationship Between Sex and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.2 presents the group effects (differences) by age level for the Sex reporting groups in the subject area of mathematics. In the subsequent

Table 3.2

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SEX REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas															Total Math
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Expressn. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic M	Busin. & Consum. Math P	Graphs and Charts Q		
State Average % Correct																
Age 9	49.4 (10)[1]	66.9 (8)	31.0 (13)		38.8 (6)			68.0 (2)			36.1 (11)			74.4 (3)		45.2 (55)
Age 13	42.1 (6)	52.3 (7)	56.7 (21)	43.6 (3)	53.5 (8)	37.3 (4)	51.8 (2)	44.3 (5)		24.3 (4)	42.0 (7)	54.7 (2)	35.1 (2)	45.7 (3)		48.0 (74)
Age 17	53.3 (4)	54.5 (5)	70.1 (21)	60.4 (3)	66.2 (6)	39.4 (5)	55.8 (5)	57.9 (5)	37.3 (2)	43.1 (4)	60.4 (5)	60.8 (2)	46.5 (5)	58.0 (6)		58.2 (78)
Group Effects: Males																
Age 9	-1.2	-1.2*	-0.8		1.9*			-3.1*			0.9			1.3		-0.3
Age 13	-2.4*	0.8	-0.6	-1.8	1.3	-0.2	-2.4	0.7		-0.1	2.3*	-3.5*	2.2	0.5		0.0
Age 17	1.4	2.8*	0.1	0.9	2.0	-0.7	1.0	1.0	-1.7	1.1	3.3*	-3.7*	5.2*	2.7*		1.2
Group Effects: Females																
Age 9	1.8	1.7*	1.3		-2.0*			4.1*			-1.8			-0.8		0.6
Age 13	2.4*	-1.0	0.6	1.8	-1.7	0.4	2.7	-1.0		0.1	-3.6*	3.8*	-2.5	-0.4		0.0
Age 17	-0.8	-2.4*	0.3	-0.7	-1.8	1.2	-0.2	-0.6	1.4	-0.2	-3.0*	3.8*	-4.5*	-2.4*		-0.8

[1] The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

sections, student performance on the relevant mathematics content areas will be discussed by age level and within each age level by males and females.

1. The Relationship Between Sex and the Performance of 9-Year-Olds in Mathematics

Nine-year-old male and female students performed near state performance levels on the seven content areas assessed and on total mathematics; however, significant differences did occur in three of the seven content areas for both males and females. Male students scored significantly below the state average percents correct on the same two content areas (Properties of Numbers and Equations)[1/] on which female students performed significantly above. On the other content area (Estimation), male students performed significantly above the state performance level while female students performed below.

2. The Relationship Between Sex and the Performance of 13-Year-Olds in Mathematics

At the 13-year-old level the results for males and females were similar to those observed at the 9-year-old level. Both 13-year-old male and female students performed near state performance levels, although significant differences did occur in three of the 13 content areas for both male and female students. Male students performed significantly below the state average percents correct on the two content areas (Number Concepts and Logic)[2/] on which female students performed significantly above. On the other content area (Geometry), male students scored significantly above the state performance level and female students scored below.

3. The Relationship Between Sex and the Performance of 17-Year-Olds in Mathematics

The performance pattern at the 17-year-old level was consistent with that at the 9- and 13-year-old levels. Both males and females performed near state performance levels. Differences which occurred in five content

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1/ Note that Content Area H (Equations) contains only two items at the 9-year-old level.

2/ Note that Content Area N (Logic) contains only two items at the 13-year-old level.

areas were significant for both groups of students and had similar magnitudes. Male students performed significantly above the state performance levels on four of these content areas (Properties of Numbers, Geometry, Consumer Math, and Graphs) and below on one (Logic).[1/] Female students performed significantly below the state performance levels on the same four content areas and above on the other.

4. Summary: Sex and Mathematics Performance

In general, male and female students at each age level performed near performance levels for all students in the state; however, at each age level significant differences occurred in a few content areas across the two reporting groups.

III. THE RELATIONSHIP BETWEEN RACE AND THE PERFORMANCE OF 9-, 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

The information for the two reporting groups of the variable Race--Black and non-black--was provided for each sample student by school officials.

A. The Relationship Between Race and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.3 presents the group effects (differences) by age level for the Race reporting groups in the subject area of reading. In the subsequent sections, student performance on the eight reading themes will be discussed by age level and within each age level by Black and non-black.

1. The Relationship Between Race and the Performance of 9-Year-Olds in Reading

A strong relationship existed between Race and the reading performance of 9-year-olds. Black students performed significantly below the state average percents correct on the eight reading themes and on total reading. Non-black students performed significantly above the state average percents correct on these same clusters.

1/ Note that Content Area N (Logic) contains only two items at the 17-year-old level.

Table 3.3

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE RACE REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes								Total Reading
	Word Meanings	Visual Aids	Following Directions	Reference Materials	Significant Facts	Main Ideas	Drawing Inferences	Critical Reading	
	1	2	3	4	5	6	7	8	
State Average % Correct									
Age 9	79.8 (3)[1/]	74.6 (11)	81.3 (4)	41.3 (7)	60.3 (6)	66.0 (6)	65.9 (6)	57.0 (7)	64.5 (50)
Age 13	81.5 (3)	78.8 (16)	82.8 (10)	77.6 (9)	81.7 (12)	61.3 (3)	81.5 (4)	64.0 (5)	78.1 (62)
Age 17	54.7 (2)	78.6 (14)	66.0 (3)	85.1 (11)	88.6 (13)	81.8 (6)	75.9 (7)	67.6 (5)	79.6 (61)
Group Effects: Blacks									
Age 9	-11.4*	-10.9*	-12.0*	-12.9*	-13.2*	-14.2*	-17.2*	-11.8*	-12.8*
Age 13	-13.7*	-12.2*	-8.1*	-18.4*	-15.3*	-21.4*	-14.9*	-18.5*	-14.2*
Age 17	-8.9*	-11.5*	-11.3*	-15.7*	-12.8*	-19.9*	-17.2*	-23.9*	-14.9*
Group Effects: Non-Blacks									
Age 9	3.1*	3.0*	3.3*	3.5*	3.6*	3.9*	4.7*	3.2*	3.5*
Age 13	3.0*	2.7*	1.8*	4.1*	3.4*	4.8*	3.3*	4.1*	3.2*
Age 17	2.1*	2.7*	2.6*	3.7*	3.0*	4.6*	4.0*	5.6*	3.5*

1/ The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

2. The Relationship Between Race and the Performance of 13-Year-Olds in Reading

There was also a strong relationship between Race and the reading performance of 13-year-olds. As in the case of 9-year-old performance, Black students performed significantly below and non-black students significantly above the performance level of 13-year-olds in the state on the eight reading themes and on total reading.

3. The Relationship Between Race and the Performance of 17-Year-Olds in Reading

The performance pattern which emerged in the Race results at the 17-year-old level was consistent with that which emerged in the Race results at both the 9- and 13-year-old levels: 17-year-old Black students scored significantly below and 17-year-old non-black students scored significantly above the state average percents correct on all reading themes and on total reading. Both negative and positive differences tended to become larger in magnitude in the progression from low to high order reading skills. The negative difference in the high order skill Critical Reading (Theme 8) was substantially larger in magnitude than any of the other differences from the state average for 17-year-old Black students.

4. Summary: Race and Reading Performance

The performance of each age group was similar across the two reporting groups of the variable Race. Nine-, thirteen-, and seventeen-year-old students classified as Black scored significantly and substantially below the state average percents correct on the eight themes and on total reading, while those classified as non-black scored significantly above the state average percents correct on these same aggregates.

B. The Relationship Between Race and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.4 presents the group effects (differences) by age level for the Race reporting groups in the subject area of mathematics. In the subsequent sections student performance on relevant mathematics content areas will be discussed by age level and within each age level by Black and non-black.

Table 3.4

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE RACE REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas														
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Express. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic L	Busin. & Consum. Math P	Graphs and Charts Q	Total Math
State Average % Correct															
Age 9	49.4 (10)[1/]	66.9 (8)	31.0 (15)		38.8 (6)			68.0 (2)			36.1 (11)			74.4 (3)	45.2 (55)
Age 13	42.1 (6)	52.3 (7)	36.7 (21)	43.6 (3)	53.5 (8)	37.3 (4)	31.8 (2)	44.3 (5)		24.3 (4)	42.0 (7)	54.7 (2)	35.1 (2)	45.7 (3)	48.0 (74)
Age 17	53.3 (4)	54.5 (5)	70.1 (21)	60.4 (3)	66.2 (6)	37.4 (5)	55.8 (5)	57.9 (5)	37.3 (2)	43.1 (4)	40.4 (5)	60.8 (2)	46.5 (5)	58.0 (6)	58.2 (75)
Group Effects: Black															
Age 9	-11.3*	-8.7*	-9.0*		-9.4*			-13.0*			-5.2*			-18.0*	-9.3*
Age 13	-18.3*	-16.8*	-14.1*	-16.5*	-22.2*	-13.0*	-20.5*	-17.6*		-15.0*	-16.9*	-20.9*	-8.9*	-18.3*	-16.5*
Age 17	-25.5*	-23.7*	-23.0*	-26.1*	-29.6*	-27.4*	-30.3*	-29.2*	-21.6*	-24.8*	-24.8*	-22.6*	-23.0*	-29.4*	-25.6*
Group Effects: Non-Black															
Age 9	3.1*	2.4*	2.5*		2.6*			3.6*			1.4*			4.9*	2.6*
Age 13	4.1*	3.7*	3.1*	3.7*	4.9*	2.9*	4.6*	3.9*		3.3*	3.8*	4.6*	2.0*	4.0*	3.7*
Age 17	5.9*	5.5*	5.4*	6.1*	6.9*	6.4*	7.1*	6.8*	5.0*	5.8*	5.8*	5.2*	5.4*	6.8*	6.0*

[1/] The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

1. The Relationship Between Race and the Performance of 9-Year-Olds in Mathematics

At the 9-year-old level a strong relationship existed between Race and mathematics performance. Black students scored significantly lower than students in the state on all seven of the content areas assessed and on total mathematics. A markedly large difference in magnitude occurred in Content Area Q (Graphs). Non-black students performed significantly above the state average percents correct on all content areas and on total mathematics.

2. The Relationship Between Race and the Performance of 13-Year-Olds in Mathematics

As indicated by the relative magnitudes of the differences on total mathematics, the relationship between Race and mathematics performance at age 13 tended to be stronger than at age 9. Black 13-year-old students performed significantly and substantially below the state average percents correct on all 13 of the content areas assessed and on total mathematics. Thirteen-year-old non-black students significantly outperformed students in the state on all of these same item clusters.

3. The Relationship Between Race and the Performance of 17-Year-Olds in Mathematics

The relationship between Race and mathematics performance appeared to be even stronger at the 17-year-old level than at the 13-year-old level. On all 14 content areas assessed and on total mathematics, the differences not only were significantly below the state performance levels for 17-year-old Black students and significantly above for 17-year-old non-black students, but also, as signified in total mathematics, were larger in magnitude than those at the 13-year-old level.

4. Summary: Race and Mathematics Performance

The relationship between Race and mathematics performance was strong at all age levels and appeared to increase in strength with increasing age. Black students at each age level performed significantly and substantially below students in the state on all content

areas assessed and on total mathematics, while non-black students at each age level performed significantly above students in the state on all content areas assessed and on total mathematics.

IV. THE RELATIONSHIP BETWEEN SIZE AND TYPE OF COMMUNITY AND THE PERFORMANCE OF 9-, 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

The reporting group of the Size and Type of Community variable for each 9-, 13-, and 17-year-old was determined using the principal's report of the percentages of enrolled students living in areas with certain population sizes and the percentages of enrolled students having parents in certain occupational categories. These two percentages were combined for each school through the use of a computerized pooling technique to create categories comparable to those reported by National Assessment. On the basis of this pooling, each sample school was classified into one of three reporting groups--large city, urban fringe and medium city, or rural. Then each sample student attending the school was assigned that classification. A general description of each reporting group follows:[1/]

1) Large city refers to a city area with a population of 200,000 or more, with a high proportion of adults not regularly employed or on welfare, and with a low proportion of adults employed in professional or managerial positions.
2) Urban fringe and medium city refers to a within-city or near-city area with a population of 25,000 or more, with a high proportion of adults employed in professional and managerial positions, and with a low proportion of adults employed in factories and in agriculture.
3) Rural refers to a rural area with a population of less than 25,000, with a high proportion of adults employed in factories and in agriculture, and with a low proportion of adults employed in professional and managerial positions.

1/ The definitions for the three reporting groups are overviews of the more detailed definitions presented in Appendix A-1.

A. The Relationship Between Size and Type of Community and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.5 presents the group effects by age level for the Size and Type of Community reporting groups in the subject area of reading. In the subsequent sections the student performance on the eight reading themes will be discussed by age level and within each level by large city, urban fringe and medium city, and rural.

1. The Relationship Between Size and Type of Community and the Performance of 9-Year-Olds in Reading

Nine-year-olds attending large city schools performed significantly below the state performance levels on total reading as well as on five of the eight reading themes (Visual Aids, Reference Materials, Significant Facts, Main Ideas, and Critical Reading). Those students attending urban fringe and medium city schools performed significantly above state performance levels on five reading themes (Visual Aids, Following Directions, Main Ideas, Drawing Inferences, and Critical Reading) and on total reading. Nine-year-olds attending rural schools performed near state performance levels on total reading and all reading themes.

2. The Relationship Between Size and Type of Community and the Performance of 13-Year-Olds in Reading

The relationship between Size and Type of Community and 13-year-old reading performance was quite similar to that at the 9-year-old level. Thirteen-year-olds attending large city schools performed significantly below the state performance levels on total reading and on all of the reading themes except Theme 7 (Drawing Inferences).

Those students attending urban fringe and medium city schools performed significantly above students in the state on total reading as well as on all of the reading themes except Theme 1 (Word Meanings). In general, the positive differences for this group of students were smaller in magnitude than the negative differences for the large city group. Those students attending rural schools performed near state averages, performing significantly below the state performance level only on Theme 8 (Critical Reading).

Table 3.5

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SIZE AND TYPE OF COMMUNITY REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes								Total Reading
	Word Meanings	Visual Aids	Following Directions	Reference Materials	Significant Facts	Main Ideas	Drawing Inferences	Critical Reading	
	1	2	3	4	5	6	7	8	
State Average % Correct									
Age 9	79.8 (3)[1]	74.6 (11)	81.3 (4)	41.3 (7)	60.3 (6)	66.0 (6)	65.9 (6)	57.0 (7)	64.5 (50)
Age 13	81.5 (3)	78.8 (16)	82.8 (10)	77.6 (9)	81.7 (12)	61.3 (3)	81.5 (4)	64.0 (5)	78.1 (62)
Age 17	54.7 (2)	78.6 (14)	66.0 (3)	85.1 (11)	88.6 (13)	81.8 (6)	75.9 (7)	67.6 (5)	79.6 (61)
Group Effects: Large City									
Age 9	0.5	-3.9*	-4.7	-6.0*	-5.5*	-4.6*	-3.8	-4.9*	-4.4*
Age 13	-5.9*	-3.8*	-2.3*	-4.3*	-4.5*	-9.3*	-4.0	-5.4*	-4.3*
Age 17	0.3	-1.6	-0.2	-3.0	-0.9	-3.9	-2.2	-4.2	-2.1
Group Effects: Urban Fringe and Medium City									
Age 9	1.3	2.8*	4.0*	2.0	2.0	3.4*	3.2*	2.6*	2.7*
Age 13	0.1	1.6*	1.5*	2.8*	3.1*	4.8*	2.2*	4.4*	2.4*
Age 17	1.8	-0.5	0.7	-0.1	-0.9	0.2	0.0	0.1	-0.2
Group Effects: Rural									
Age 9	-2.0	-1.9	-3.2	0.2	0.0	-2.4	-2.6	-1.1	-1.5
Age 13	2.3	-0.8	-1.4	-2.4	-2.8	-3.4	-1.7	-4.3*	-1.8
Age 17	-1.7	1.1*	-0.5	1.4	1.2	1.5	0.9	1.7	1.1

[1] The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

3. The Relationship Between Size and Type of Community and the Performance of 17-Year-Olds in Reading

Seventeen-year-old students performed near state performance levels for each of the three reporting groups. No significant differences occurred in any theme for students attending large city or urban fringe and medium city schools; however, one difference significantly above the state performance level did occur in Theme 2 (Visual Aids) for students attending rural schools.

4. Summary: Size and Type of Community and Reading Performance

As evidenced in total reading, the performance pattern was the same at both the 9- and 13-year-old levels: students attending large city schools performed significantly below the state average percents correct; those attending urban fringe and medium city schools performed significantly above the state average percents correct; and those attending rural schools performed at a level similar to the state average percents correct. Seventeen-year-olds in each of the three community categories performed at a level similar to the state average percent correct.

B. The Relationship Between Size and Type of Community and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.6 presents the group effects (differences) by age level for the Size and Type of Community reporting groups in the subject area of mathematics. In the subsequent sections student performance on the relevant mathematics content areas will be discussed by age level and within each age level by large city, urban fringe and medium city, and rural.

1. The Relationship Between Size and Type of Community and the Performance of 9-Year-Olds in Mathematics

Nine-year-old students attending large city schools performed significantly below the state performance levels on two of the seven content areas assessed (Properties of Numbers and Geometry) and on total mathematics. The results for 9-year-old students attending urban fringe and medium city schools and for those attending rural

Table 3.6

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SIZE AND TYPE OF COMMUNITY REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas														Total Math
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Express. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic M	Estim. & Commun. Math P	Graphs and Charts Q	
State Average % Correct															
Age 9	49.4 (10)[1]	44.9 (8)	31.0 (15)		38.8 (6)			48.0 (2)			36.1 (11)			74.4 (3)	45.2 (53)
Age 13	42.1 (6)	52.3 (7)	56.7 (21)	43.6 (3)	53.5 (8)	37.3 (4)	51.8 (3)	44.3 (5)		24.3 (4)	42.0 (7)	34.7 (2)	33.1 (2)	43.7 (3)	48.0 (74)
Age 17	53.3 (4)	54.5 (5)	70.1 (21)	60.4 (3)	66.2 (6)	57.4 (5)	55.8 (3)	57.9 (5)	37.3 (3)	43.1 (4)	40.4 (5)	60.8 (7)	44.5 (5)	36.0 (4)	58.2 (78)
Group Effects: Large City															
Age 9	-4.0	-2.5*	-2.8		-2.6			-5.5			-5.0*			-3.7	-3.5*
Age 13	-9.4*	-4.1*	-3.4*	-6.6	-6.3*	-7.1*	-12.3*	-7.1*		-8.4*	-8.4*	-8.7*	-2.6	-8.3*	-6.7*
Age 17	-2.9	-4.5	-3.0	-8.3*	-3.7	-6.9*	-6.0	-5.8	-1.8	-4.1*	-7.4*	-1.6	-4.2	-4.8	-4.6
Group Effects: Urban Fringe and Medium City															
Age 9	1.5	1.0	1.7		2.8			0.9			1.5			3.3*	1.6
Age 13	3.9*	1.8	2.7*	3.4	1.3	2.9*	4.9*	2.0		3.5*	2.7*	4.3*	1.8	3.1*	2.7*
Age 17	0.4	-2.3	-1.4	-0.2	-1.3	-0.1	-1.2	-0.9	0.8	0.8	-2.1	-1.7	-0.8	-0.1	-0.9
Group Effects: Rural															
Age 9	-0.1	-0.1	-0.9		-1.6			1.4			0.4			-2.8	-0.5
Age 13	-1.9	-1.0	-1.8	-2.4	0.6	-1.4	-2.2	0.0		-1.7	-0.4	-2.9	-0.7	-1.2	-1.2
Age 17	0.9	4.0*	2.6*	3.8*	2.7	3.1	3.7	3.2	0.0	1.9	3.0*	2.3	2.5	2.1	2.8

[1] The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

schools were basically consistent with the results observed for all students in the state. As indicated in total mathematics, students attending rural schools scored closer to the state average percent correct than did students attending urban fringe and medium city schools. Those students in the urban fringe and medium city schools did perform significantly above the state in Content Area Q (Graphs).

2. The Relationship Between Size and Type of Community and the Performance of 13-Year-Olds in Mathematics

Thirteen-year-old students attending large city schools performed significantly below the state performance levels on total mathematics and on all of the 13 content areas assessed except two (Sets and Consumer Math).[1/] Those students attending urban fringe and medium city schools performed significantly above the state performance levels on total mathematics and on eight content areas (Number Concepts, Computation, Exponents and Logarithms, Algebra, Probability, Geometry, Logic, and Graphs). Those students attending rural schools performed near state performance levels on total mathematics and on all content areas.

3. The Relationship Between Size and Type of Community and the Performance of 17-Year-Olds in Mathematics

Seventeen-year-old students classified in each of the community groups performed much like students in the state; however, significant differences did occur in several content areas for two of the reporting groups. Seventeen-year-old students attending large city schools scored significantly below the state average percents correct on four of the 14 content areas assessed (Sets, Exponents and Logarithms, Probability, and Geometry), whereas those attending rural schools scored significantly above the state average percents correct on four content areas (Properties of Numbers, Computation, Sets, and Geometry). Students attending urban fringe and medium city schools performed near state performance levels on total mathematics and on all content areas.

1/ Note that Content Area G (Algebra) and Content Area N (Logic) contain only two items at the 13-year-old level.

4. Summary: Size and Type of Community and Mathematics Performance

Nine-, thirteen-, and seventeen-year-old students attending rural schools performed near state performance levels. Students attending large city schools performed significantly below the state average at the 9-year-old level, significantly and substantially below the state average at the 13-year-old level, and near the state average at the 17-year-old level. The results for 9- and 17-year-old students attending urban fringe schools were consistent with those for students in the state; however, the results for 13-year-old students in this same classification were significantly above those for students in the state.

V. THE RELATIONSHIP BETWEEN PARENTS' EDUCATION AND THE PERFORMANCE OF 9-, 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

Parents' Education refers to the highest level of education obtained by either parent. Students reported both their father's and their mother's educational level. This information was used to classify the students into one of the following four reporting groups: less than high school graduate, high school graduate, post high school, and unknown.

Only the results for students classified in the less than high school graduate, high school graduate, and post high school reporting groups will be presented and discussed in this section. The unknown reporting group included students who did not know either parent's educational level or who failed to provide any of the requested information about parental educational levels. The results for these students are presented in Appendices B, C, D, E, F, and G.

A. The Relationship Between Parents' Education and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.7 presents the group effects (differences) by age level for the Parents' Education reporting groups in the subject area of reading. In the subsequent sections, student performance on the eight reading themes will be

Table 3.7

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE PARENTS' EDUCATION REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes								Total Reading
	Word Meanings 1	Visual Aids 2	Following Directions 3	Reference Materials 4	Significant Facts 5	Main Ideas 6	Drawing Inferences 7	Critical Reading 8	
State Average % Correct									
Age 9	79.8 (3)[1]	74.6 (11)	81.3 (4)	41.3 (7)	60.3 (6)	66.0 (6)	65.9 (6)	57.0 (7)	64.5 (50)
Age 13	81.5 (3)	78.8 (16)	82.8 (10)	77.6 (9)	81.7 (12)	61.3 (3)	81.5 (6)	64.0 (5)	78.1 (62)
Age 17	54.7 (2)	78.6 (14)	66.0 (3)	83.1 (11)	88.6 (13)	81.8 (6)	75.9 (7)	67.6 (5)	79.6 (61)
Group Effects: Less Than High School Graduate									
Age 9	-5.1	-4.3*	-2.7	-8.2*	-3.4	-6.1*	-11.9*	-8.9*	-6.6*
Age 13	-4.7	-4.2	-2.3	-8.2*	-5.4*	-10.1*	-3.2	-8.2*	-5.3*
Age 17	-7.9*	-8.2*	-10.6*	-10.9*	-7.0*	-15.3*	-12.2*	-18.0*	-10.5*
Group Effects: High School Graduate									
Age 9	-1.0	0.0	0.8	1.9	2.5	1.0	-1.5	1.9	0.8
Age 13	-1.0	-1.5*	-0.8	-2.6	-0.7	-3.3	-1.9	-2.5*	-1.6
Age 17	-3.4	-2.4*	-1.6	-2.7*	-3.3*	-3.1	-2.6*	-4.5*	-2.9*
Group Effects: Post High School Graduate									
Age 9	2.7	3.8*	2.6	6.2*	4.4*	4.9*	6.6*	5.6*	4.8*
Age 13	4.5*	4.1*	2.7*	6.8*	5.3*	9.8*	5.6*	7.6*	5.1*
Age 17	4.6*	3.8*	4.5*	4.8*	4.6*	6.6*	3.8*	8.2*	5.1*

[1] The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

discussed by age level and within each age level by less than high school graduate, high school graduate, and post high school.

1. The Relationship Between Parents' Education and the Performance of 9-Year-Olds in Reading

Nine-year-olds whose parents had some schooling but had not graduated from high school performed significantly and substantially below the state performance levels on total reading and on five reading themes (Visual Aids, Reference Materials, Main Ideas, Drawing Inferences, and Critical Reading). Those students having at least one parent who had graduated from high school performed near state performance levels. Those students having at least one parent who had education beyond high school scored significantly above the state performance levels on total reading and on all reading themes except Word Meanings and Following Directions.

2. The Relationship Between Parents' Education and the Performance of 13-Year-Olds in Reading

Thirteen-year-old students whose parents had some schooling but had not graduated from high school performed significantly and substantially below students in the state on total reading and on four themes (Reference Materials, Significant Facts, Main Ideas, and Critical Reading).

Those students having at least one parent who was a high school graduate performed near state performance levels. Differences significantly below the state average percents correct occurred in two themes (Visual Aids and Critical Reading); however, these differences were relatively small in magnitude. Those students having at least one parent with education beyond high school performed significantly above the state performance levels on every theme and on total reading.

3. The Relationship Between Parents' Education and the Performance of 17-Year-Olds in Reading

A strong relationship existed between Parents' Education and the reading performance of 17-year-olds. Seventeen-year-old students whose parents had some schooling but had not graduated from high school performed significantly and substantially below the state performance

levels on all reading themes and on total reading. Those students having at least one parent who had graduated from high school scored significantly below students in the state on total reading and on five reading themes (Visual Aids, Reference Materials, Significant Facts, Drawing Inferences, and Critical Reading). Those students having at least one parent who had education beyond high school significantly outperformed students in the state on every theme and on total reading.

4. Summary: Parents' Education and Reading Performance

The relationship between Parents' Education and reading performance tended to become progressively stronger with increasing age. Students classified in the less than high school group performed significantly below the state performance levels on total reading at all three age levels, and students classified in the post high school group performed significantly above the state performance levels on total reading at all three age levels. Nine- and thirteen-year-old students classified in the high school graduate group performed near state performance levels, while 17-year-old students in the same reporting group performed significantly below the state average percent correct.

B. The Relationship Between Parents' Education and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.8 presents the group effects (differences) by age level for the Parents' Education reporting groups in the subject area of mathematics. In the subsequent sections the results for the relevant content areas will be discussed by age level and within each age level by less than high school graduate, high school graduate, and post high school.

1. The Relationship Between Parents' Education and the Performance of 9-Year-Olds in Mathematics

Nine-year-old students whose parents had some schooling but had not graduated from high school scored significantly below the state average percents correct on four of the seven content areas assessed (Number

Table 3.8

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE PARENTS' EDUCATION REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas														Total Math
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Express. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic M	Busin. & Consum. Math P	Graphs and Charts Q	
State Average % Correct															
Age 9	49.4 (10)[1]	66.9 (8)	31.0 (15)		38.8 (6)			68.0 (2)			36.1 (11)			74.4 (3)	45.2 (55)
Age 13	42.1 (6)	52.3 (7)	56.7 (21)	43.6 (3)	53.5 (8)	37.3 (4)	51.8 (2)	44.3 (5)		26.3 (4)	43.0 (7)	34.7 (2)	35.1 (2)	45.7 (3)	48.0 (74)
Age 17	53.3 (4)	54.5 (5)	70.1 (21)	60.4 (3)	66.2 (6)	57.4 (5)	55.8 (5)	57.9 (5)	57.3 (2)	43.1 (4)	60.4 (5)	60.8 (2)	46.5 (5)	58.0 (6)	58.2 (78)
Group Effects: Less Than High School Graduate															
Age 9	-5.8*	-3.2*	-3.2*		-3.3			-1.7			-2.9*			-5.1	-3.9*
Age 13	-8.4*	-10.1*	-7.0*	-6.6	-4.7	-3.7	-7.5	-10.3*		-8.8*	-8.0*	-10.3*	0.0	-8.7*	-7.5*
Age 17	-18.2*	-17.9*	-14.9*	-21.7*	-19.2*	-23.1*	-22.7*	-23.0*	-20.4*	-17.5*	-19.6*	-17.1*	-18.4*	-21.1*	-18.7*
Group Effects: High School Graduate															
Age 9	1.0	1.4	2.2		1.4			2.3			1.4			0.6	1.5
Age 13	-5.0*	-4.0*	-3.8*	-9.4	-4.0*	-3.6*	-4.3	-1.4		0.4	-3.3*	-6.0*	-1.4	-3.6	-3.5*
Age 17	-3.3	-4.5	-4.1*	-4.8*	-4.2	-7.2*	-3.8*	-4.8*	-7.1*	-3.4	-6.5*	-7.2*	-3.5	-5.4*	-4.9*
Group Effects: Post High School															
Age 9	5.6*	2.3*	5.2*		3.9*			4.3			3.5*			4.4*	4.2*
Age 13	8.8*	8.2*	6.6*	7.9*	7.2*	6.3*	8.5*	5.7*		5.3*	6.7*	10.3*	2.8	7.8*	7.0*
Age 17	8.6*	8.2*	7.1*	9.2*	7.7*	11.1*	10.7*	9.3*	9.4*	7.6*	9.5*	9.3*	7.3*	9.5*	8.5*

[1] The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

Concepts, Properties of Numbers, Computation, and Geometry) and on total mathematics. Those students having at least one parent who had graduated from high school performed near the state averages. Those students having at least one parent who had education beyond high school significantly surpassed students in the state on total mathematics and on all content areas except the one dealing with equations.

2. The Relationship Between Parents' Education and the Performance of 13-Year-Olds in Mathematics

Thirteen-year-olds whose parents had some schooling but had not graduated from high school performed significantly and substantially below students in the state on eight of the 13 content areas assessed (Number Concepts, Properties of Numbers, Computation, Equations, Probability, Geometry, Logic, and Graphs)[1/] and on total mathematics. Those students having at least one parent who had graduated from high school performed significantly below the state performance levels on seven content areas (Number Concepts, Properties of Numbers, Computation, Estimation, Exponents and Logarithms, Geometry, and Logic) and on total mathematics. Those students having at least one parent who had education beyond high school significantly and substantially outperformed students in the state on total mathematics and on every content area except Consumer Mathematics.

3. The Relationship Between Parents' Education and the Performance of 17-Year-Olds in Mathematics

There was a strong relationship between Parents' Education and the performance of 17-year-olds in mathematics. Seventeen-year-old students whose parents had some schooling but had not graduated from high school performed significantly and substantially below the state performance levels on every content area and on total mathematics. The differences were markedly larger in magnitude than those observed at the 9- and 13-year-old levels. Those students who had at least one parent who had graduated from high school scored below the state average

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1/ Note that Content Area N (Logic) contains only two items at the 13-year-old level.

percents correct on total mathematice and on nine of the 14 content areas assessed (Computation, Sets, Exponents and Logarithms, Algebra, Equations, Functions, Geometry, Logic, and Graphs).[1/] Those students having at least one parent who had education beyond high school significantly and substantially outperformed students in the state on all 14 content areas and on total mathematics. The positive differences were large in magnitude but not as large as the negative differences observed for students in the less than high school group.

4. Summary: Parents' Education and Mathematics Performance

As age level increased the relationship between Parents' Education and mathematics performance became stronger. As evidenced in total mathematics, at all three age levels students whose parents had some schooling but had not graduated from high school performed significantly below the state performance level, while students having at least one parent who had education beyond high school performed significantly above. The mathematics performance deficit for 17-year-old students in the less than high school graduate group was markedly larger than that for 9- and 13-year-old students in this reporting group. Thirteen- and seventeen-year-old students having at least one parent who had graduated from high school also performed significantly below the state performance levels, while 9-year-old students in this group performed near the state performance level.

VI. THE RELATIONSHIP BETWEEN READING MATERIALS IN HOME AND THE PERFORMANCE OF 9-, 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

Reading Materials in Home refers to the availability of different types of reading materials found in the homes of 9-, 13-, and 17-year-old students. Each sample student was asked about the availability of newspapers, magazines, books, and encyclopedias. The procedure for determining the reporting groups

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1/ Note that Content Area I (Functions) and Content Area N (Logic) contain only two items at the 17-year-old level.

was based on the total number of these four types of reading materials available to the student in the home. The categories used in reporting the results for this variable are: limited availability (none or one of the four types), medium availability (two or three of the four types), and wide-range availability (all four types).

A. The Relationship Between Reading Materials in Home and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.9 presents the group effects (differences) by age level for the Reading Materials in Home reporting groups in the subject area of reading. In the subsequent sections student performance on the eight reading themes will be discussed by age level and within each age level by limited availability, medium availability, and wide-range availability.

1. The Relationship Between Reading Materials in Home and the Performance of 9-Year-Olds in Reading

Nine-year-old students having reading materials of limited availability in the home performed significantly below students in the state on every reading theme and on total reading. Nine-year-old students having reading materials of medium availability in the home performed near performance levels for all students in the state. Nine-year-old students having reading materials of wide-range availability in the home scored significantly above the state average percents correct on total reading and on five of the eight themes (Visual Aids, Following Directions, Reference Materials, Significant Facts, and Critical Reading).

2. The Relationship Between Reading Materials in Home and the Performance of 13-Year-Olds in Reading

There was a strong relationship between Reading Materials in Home and 13-year-old reading performance. Thirteen-year-olds having reading materials of limited availability in the home scored significantly and substantially below the state performance levels on every reading theme and on total reading. The negative differences were large in magnitude and, as evidenced in total reading, tended to be larger

Table 3.9

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE READING MATERIALS IN HOME REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes: Word Meanings 1	Visual Aids 2	Following Directions 3	Reference Materials 4	Significant Facts 5	Main Ideas 6	Drawing Inferences 7	Critical Reading 8	Total Reading
State Average % Correct									
Age 9	79.8 (3)[1]	74.6 (11)	81.3 (4)	41.3 (7)	60.3 (6)	66.0 (6)	63.9 (6)	57.0 (7)	64.5 (50)
Age 13	81.5 (3)	78.8 (16)	82.8 (10)	77.6 (9)	81.7 (12)	61.3 (3)	81.5 (4)	64.0 (5)	78.1 (62)
Age 17	54.7 (2)	78.6 (14)	66.0 (3)	85.1 (11)	88.6 (13)	81.8 (6)	75.9 (7)	67.6 (5)	79.6 (61)
Group Effects: Limited Availability									
Age 9	-4.8*	-4.3*	-6.6*	-7.8*	-7.4*	-7.9*	-8.5*	-7.5*	-6.8*
Age 13	-13.6*	-9.6*	-8.0*	-16.1*	-12.6*	-16.1*	-10.8*	-16.7*	-11.9*
Age 17	-12.4*	-10.8*	-11.3	-10.2*	-12.6*	-21.8*	-15.9*	-16.7*	-13.3*
Group Effects: Medium Availability									
Age 9	0.7	-0.1	-0.3	0.6	1.1	1.0	1.5	0.6	0.6
Age 13	-3.4*	-3.3*	-2.5*	-4.2*	-4.4*	-8.5*	-5.0*	-3.8*	-3.9*
Age 17	-8.8*	-4.3*	-9.7*	-7.2*	-6.6*	-8.8*	-7.2*	-12.1*	-7.1*
Group Effects: Wide-Range Availability									
Age 9	1.7	3.8*	6.2*	4.4*	2.6*	3.1	2.2	4.0*	3.6*
Age 13	4.6*	4.1*	3.3*	5.7*	5.6*	8.8*	5.8*	5.4*	4.9*
Age 17	4.9*	2.7*	5.3*	4.0*	3.9*	5.8*	4.4*	6.8*	4.2*

[1] The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

than the corresponding differences at the 9-year-old level. Those students having reading materials of medium availability in the home also performed significantly below the state average percents correct on all reading themes and on total reading; however, the performance deficits were much smaller than those for students having reading materials of limited availability in the home. Those students having reading materials of wide-range availability in the home scored significantly above students in the state on all themes and on total reading.

3. The Relationship Between Reading Materials in Home and the Performance of 17-Year-Olds in Reading

At the 17-year-old level the performance pattern was similar to that at the 13-year-old level. The 17-year-old students having reading materials of limited availability in the home performed significantly below the state performance levels on total reading and on every theme except Theme 3 (Following Directions). Those students having reading materials of medium availability in the home scored significantly below students in the state on every theme and on total reading. Those students having reading materials of wide-range availability in the home significantly outperformed students in the state on every reading theme and on total reading.

4. Summary: Reading Materials in Home and Reading Performance

A strong relationship existed between Reading Materials in Home and reading performance at the 13- and 17-year-old levels and a relationship existed at the 9-year-old level. Students classified in the limited availability group at each age level performed significantly below the state performance levels on total reading. At the 9-year-old level students classified in the medium availability group performed much like students in the state on total reading, while at the 13- and 17-year-old levels students classified in this group performed significantly below the state performance levels on total reading. Reading performance for students classified in the wide-range availability group was similar across the three age groups; at each of the

three age levels students classified in this reporting group performed significantly above the state performance levels on total reading.

B. The Relationship Between Reading Materials in Home and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.10 presents the group effects (differences) by age level for the Reading Materials in Home reporting groups in the subject area of mathematics. In the subsequent sections student performance on the relevant mathematics content areas will be discussed by age level and within each age level by limited availability, medium availability, and wide-range availability.

1. The Relationship Between Reading Materials in Home and the Performance of 9-Year-Olds in Mathematics

Nine-year-old students having reading materials of limited availability in the home performed significantly below students in the state on total mathematics and on all of content areas assessed except Equations. Those students having reading materials of medium availability in the home performed near the performance levels for all students in the state. Those students having materials of wide-range availability in the home significantly outperformed students in the state on every content area and on total mathematics.

2. The Relationship Between Reading Materials in Home and the Performance of 13-Year-Olds in Mathematics

At the 13-year-old level Reading Materials in Home was strongly related to mathematics performance. Thirteen-year-old students having reading materials of limited availability in the home scored significantly and substantially below students in the state on all 13 content areas assessed and on total mathematics. A markedly large difference occurred in Content Area G (Algebra); however, it should be noted that this content area contained only two items at the 13-year-old level.

Those students having reading materials of medium availability in the home scored significantly below the state average percents correct

Table 3.10

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE
READING MATERIALS IN HOME REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas														
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Express. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic M	Busin. & Consum. Math P	Graphs and Charts Q	Total Math
State Average % Correct															
Age 9	49.4 (10)[1]	66.9 (8)	31.0 (13)		38.8 (6)			48.0 (2)			36.1 (11)			74.4 (3)	45.2 (55)
Age 13	42.1 (6)	52.3 (7)	56.7 (21)	43.6 (3)	53.5 (8)	37.3 (4)	31.8 (3)	44.3 (5)		24.3 (4)	42.0 (7)	24.7 (2)	25.1 (2)	45.7 (3)	40.0 (74)
Age 17	53.3 (4)	54.5 (5)	70.1 (21)	60.4 (3)	66.2 (6)	57.4 (5)	33.8 (3)	57.9 (5)	57.3 (2)	43.1 (4)	40.4 (5)	60.8 (2)	46.3 (5)	38.0 (6)	58.2 (78)
Group Effects: Limited Availability															
Age 9	-6.8*	-5.2*	-5.9*		-5.3*			-3.4			-3.9*			-8.9*	-5.6*
Age 13	-16.4*	-15.7*	-11.4*	-13.0*	-17.5*	-7.0*	-23.3*	-13.7*		-13.9*	-16.7*	-16.1*	-8.4*	-14.4*	-14.8*
Age 17	-16.4*	-16.6*	-15.8*	-13.3*	-14.9*	-17.9*	-20.5*	-18.9*	-4.7	-16.5*	-16.3*	-11.9	-17.8*	-17.6*	-16.4*
Group Effects: Medium Availability															
Age 9	0.0	-0.2	-0.2		-0.4			-1.1			-0.3			0.5	-0.2
Age 13	-7.1*	-8.1*	-5.5*	-7.1*	-5.9*	-4.2*	-3.1*	-4.5*		-3.4*	-6.1*	-6.3*	-2.0	-6.0*	-5.9*
Age 17	-11.3*	-10.9*	-9.7*	-12.3*	-11.0*	-13.7*	-13.6*	-13.7*	-13.2*	-9.4*	-10.0*	-13.1*	-6.4*	-11.0*	-11.0*
Group Effects: Wide Range Availability															
Age 9	3.5*	3.0*	3.5*		3.6*			6.1*			4.0*			3.5*	3.1*
Age 13	7.8*	8.6*	6.0*	7.3*	7.1*	4.5*	7.6*	3.6*		6.3*	7.0*	9.3*	2.9*	7.0*	6.7*
Age 17	6.7*	6.6*	5.9*	7.0*	6.8*	8.0*	8.2*	8.1*	6.4*	6.0*	6.1*	7.1*	4.6*	6.7*	6.6*

1/ The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

on total mathematics and on every content area except Content Area P (Consumer Mathematics). Although these students performed below the state performance levels, the mathematics performance deficits were not as great as those for students having materials of limited availability in the home. Those students having reading materials of wide-range availability in the home significantly outperformed students in the state on every content area and on total mathematics.

3. The Relationship Between Reading Materials in Home and the Performance of 17-Year-Olds in Mathematics

A strong relationship was also exhibited between Reading Materials in Home and mathematics performance at the 17-year-old level. Seventeen-year-old students having materials of limited availability in the home performed significantly and substantially below the state performance levels on total mathematics and on every content area except Content Areas I and N (Functions and Logic, each of which contained only two items).

Those students having materials of medium availability in the home performed significantly and substantially below the state performance levels on all 14 content areas assessed and on total mathematics. In general, the differences were smaller in magnitude than those on corresponding content areas for students in the limited availability group. Those students having materials of wide-range availability in the home performed significantly above the state performance levels on all content areas and on total mathematics.

4. Summary: Reading Materials in Home and Mathematics Performance

A strong relationship existed between Reading Materials in Home and mathematics performance at all three age levels. In general, students having materials of limited availability in the home performed below the state performance levels on total mathematics; however, the greatest performance deficits occurred at the 13- and 17-year-old levels. Students having materials of medium availability in the home performed much like students in the state on total mathematics at the

9-year-old level and performed below the state average percents correct on total mathematics at the 13- and 17-year-old levels with the greatest performance deficit occurring at the 17-year-old level. At all three age levels those students having materials of wide-range availability performed significantly above the state performance levels on total mathematics.

VII. THE RELATIONSHIP BETWEEN SPANISH AS A NATIVE LANGUAGE AND THE PERFORMANCE OF 9- 13-, AND 17-YEAR-OLDS IN READING AND MATHEMATICS

Students at each age level were asked whether or not they had learned to speak Spanish before they had learned to speak English. The results were grouped in terms of two response categories: "yes", those students who said they learned Spanish first, and "no", those who said they did not learn Spanish first.

A. The Relationship Between Spanish as a Native Language and the Performance of 9-, 13-, and 17-Year-Olds in Reading

Table 3.11 presents the group effects (differences) by age level for the Spanish as a Native Language reporting groups in the subject area of reading. In the subsequent sections student performance on the eight reading themes will be discussed by age level and within each age level by the two response categories.

1. The Relationship Between Spanish as a Native Language and the Performance of 9-Year-Olds in Reading

Nine-year-old students who responded "yes" scored significantly below the state performance levels on total reading and on five of the eight reading themes (Visual Aids, Reference Materials, Significant Facts, Main Ideas, and Drawing Inferences). Those students who responded "no" scored significantly above the state performance levels on these same themes with the exception of Reference Materials.

Table 3.11

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SPANISH AS A NATIVE LANGUAGE REPORTING GROUPS BY READING THEME AND BY AGE LEVEL

Age Level	Reading Themes: Word Meanings 1	Visual Aids 2	Following Directions 3	Reference Materials 4	Significant Facts 5	Main Ideas 6	Drawing Inferences 7	Critical Reading 8	Total Reading
State Average % Correct									
Age 9	79.3 (3)[1/]	74.5 (11)	81.0 (4)	41.0 (7)	60.2 (6)	65.7 (6)	65.5 (6)	57.0 (7)	64.3 (50)
Age 13	81.3 (3)	78.6 (16)	82.8 (10)	77.4 (9)	81.6 (12)	61.0 (3)	81.5 (4)	63.8 (5)	78.0 (62)
Age 17	54.5 (2)	78.5 (14)	65.7 (3)	85.0 (11)	88.4 (13)	81.7 (6)	75.7 (7)	67.4 (5)	79.4 (61)
Group Effects: Yes									
Age 9	-4.3	-4.2*	-3.3	-5.2*	-5.9*	-6.4*	-8.0*	-4.4	-5.2*
Age 13	-12.8*	-6.3*	-3.9*	-4.0*	-6.8*	-12.3*	-6.5*	-10.0*	-6.6*
Age 17	-7.4*	-5.2*	-14.8*	-5.1*	-8.7*	-10.4*	-10.5*	-10.3*	-8.0*
Group Effects: No									
Age 9	0.4	0.4*	0.3	0.5	0.6*	0.6*	0.8*	0.4	0.5*
Age 13	1.0*	0.5*	0.3*	0.3*	0.6*	1.0*	0.5*	0.8*	0.5*
Age 17	0.4*	0.2*	0.7*	0.2*	0.4*	0.5*	0.5*	0.5*	0.4*

[1/] The numbers in parentheses represent the total number of items in each reading theme for each of the three age levels.

2. The Relationship Between Spanish as a Native Language and the Performance of 13-Year-Olds in Reading

Thirteen-year-old students who responded "yes" scored significantly below the state performance levels on the eight reading themes and on total reading. Those students who responded "no" scored significantly above the state performance levels on every theme and on total reading.

3. The Relationship Between Spenish as a Native Language and the Performance of 17-Year-Olds in Reading

At the 17-year-old level, there was a strong relationship between Spanish as a Native Language and reading performance. Seventeen-year-old students who responded "yes" scored significantly and substantially below the state performance levels on every reading theme and on total reading. Those students who responded "no" performed significantly above the state performance levels on every theme and on total reading.

4. Summary: Spanish as a Native Language and Reading Performance

The performance pattern on total reading was similar across all three age levels. At each age level, students who learned Spanish first ("yes") performed significantly below the state performance levels, while those who did not learn Spanish first ("no") performed significantly above the state performance levels.

B. The Relationship Between Spanish Native Language and the Performance of 9-, 13-, and 17-Year-Olds in Mathematics

Table 3.12 presents the group effects (differences) by age level for the Spanish as a Native Language reporting groups in the subject area of mathematics. In the subsequent sections student performance on the relevant mathematics content areas will be discussed by age level and within each age level by the two response categories.

1. The Relationship Between Spanish as a Native Language and the Performance of 9-Year-Olds in Mathematics

Nine-year-old students who responded "yes" performed significantly below the state performance levels on three of the seven content

Table 3.12

STATE AVERAGE PERCENTS CORRECT AND GROUP EFFECTS FOR THE SPANISH AS A NATIVE LANGUAGE REPORTING GROUPS BY MATHEMATICS CONTENT AREA AND BY AGE LEVEL

Age Level	Content Areas														
	Number & Numer. Concepts A	Prop. of Numbers and Oper. B	Arith. Comput. C	Sets D	Estim. & Measure. E	Expon. & Logar. F	Algeb. Express. G	Equat. & Inequal. H	Functions I	Probab. & Stat. J	Geometry K	Logic M	Busin. & Consum. Math P	Graphs and Charts Q	Total Math
State Average % Correct															
Age 9	49.2 (10)[1]	66.5 (8)	30.7 (15)		38.3 (6)			67.5 (2)			35.8 (11)			74.0 (3)	44.8 (55)
Age 13	41.7 (6)	52.0 (7)	56.6 (21)	43.0 (3)	53.2 (8)	37.0 (4)	51.5 (2)	44.0 (5)		24.0 (4)	41.6 (7)	34.3 (2)	35.0 (2)	48.3 (3)	47.7 (74)
Age 17	53.5 (4)	54.4 (5)	70.1 (21)	60.3 (3)	66.2 (6)	57.4 (3)	55.8 (5)	50.0 (5)	37.5 (2)	43.0 (4)	40.4 (5)	60.5 (2)	46.6 (5)	58.0 (6)	58.2 (78)
Group Effects: Yes															
Age 9	-2.7	-3.3	-3.0		-4.6			-6.7*			-9.7*			-5.8*	-4.0*
Age 13	-10.0*	-10.2*	-6.1*	-13.9*	-11.0*	-6.3*	-15.2*	-10.2*		-10.2*	-11.3*	-10.6*	-4.9*	-8.9*	-9.1*
Age 17	-7.5*	-12.4*	-7.8*	-10.4*	-13.0*	-9.0*	-12.0*	-10.5*	-9.3*	-12.8*	-9.1*	-8.4*	-11.0*	-14.5*	-10.2*
Group Effects: No															
Age 9	0.3	0.3	0.3		0.4			0.7*			0.6*			0.6	0.4
Age 13	0.8	0.8*	0.5*	1.1*	0.9*	0.5*	1.2*	0.8*		0.8*	0.9*	0.9*	0.4	0.7*	0.7*
Age 17	0.4*	0.6*	0.4*	0.3*	0.6*	0.4*	0.6*	0.5*	0.5*	0.6*	0.4*	0.4*	0.5*	0.7*	0.5*

[1] The numbers in parentheses represent the total number of items in each content area for each of the three age levels.

areas assessed (Equations, Geometry, and Graphs)[1/] and on total mathematics. Those students who responded "no" were near the state average percent correct on total mathematics, but they did perform significantly above the state on two content areas (Equations and Geometry).

2. The Relationship Between Spanish as a Native Language and the Performance of 13-Year-Olds in Mathematics

The results for Spanish as a Native Language at the 13-year-old level exhibited a strong relationship to mathematics performance. Thirteen-year-old students who responded "yes" performed significantly and substantially below the state performance level on all 13 content areas assessed and on total mathematics. Those who responded "no" performed significantly above the state performance levels on total mathematics and on all content areas except Number Concepts and Consumer Mathematics.[2/]

3. The Relationship Between Spanish as a Native Language and the Performance of 17-Year-Olds in Mathematics

The mathematics performance of 17-year-olds resembled that of 13-year-olds for the two response categories. Seventeen-year-old students who responded "yes" performed significantly and substantially below students in the state on all of the fourteen content areas assessed and on total mathematics. Those students who responded "no" performed significantly above the state performance level on all content areas and on total mathematics.

4. Summary: Spanish as a Native Language and Mathematics Performance

At the 13- and 17-year-old levels a strong relationship existed between Spanish as a Native Language and mathematics performance. Students who learned Spanish first ("yes") performed significantly and substantially below the state performance levels on all content areas assessed and on total mathematics. Students who did not learn Spanish

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1/ Note that Content Area H (Equations) contains only two items at the 9-year-old level.

2/ Note that Content Area G (Algebra) and Content Area N (Logic) contain only two items at the 13-year-old level.

first ("no") performed significantly above the state performance levels on most of the content areas assessed and on total mathematics. Nine-year-old students who responded "yes" also performed significantly below the state average percent correct on total mathematics; however, the performance deficit was much smaller than those at ages 13 and 17.

VIII. SUMMARY

Reading and mathematics results for the reporting groups within the six reporting variables were generally consistent with findings of other educational studies relating student performance to similar characteristics. In reading, females performed significantly above state performance levels at all three ages (9, 13, and 17) while males performed significantly below state performance levels. In mathematics, neither males nor females performed significantly different than the performance levels for all students in the state.

The results for the other five variables were more consistent across subject areas. At all three age levels, Black students in Florida scored significantly and substantially below state performance levels in both reading and mathematics while non-black students scored significantly above state performance levels.

Students attending schools in large cities scored significantly below state performance levels in both reading and mathematics at ages 9 and 13. Students attending schools in urban fringes and medium cities performed significantly above the state average in reading at age 9, and they performed significantly above state averages in both reading and mathematics at age 13. Students attending schools in rural areas did not perform significantly different than the state average at any age level.

Students from homes in which neither parent graduated from high school performed significantly below state levels in reading and mathematics at all three ages; whereas, students from homes in which at least one parent has attained education beyond high school graduation performed

significantly above state levels in reading and mathematics at all three ages. Students from homes in which at least one parent graduated from high school but neither parent went beyond high school scored significantly below state performance levels in mathematics at age 13 and significantly below state performance levels in reading and mathematics at age 17.

When there was a limited availability of reading materials in the home, students at all three ages performed significantly below state performance levels in reading and mathematics; and when there was a wide-range availability, students at all three age levels scored significantly above state averages in both subject areas. Students from those homes in which there was a medium availability performed significantly below state averages in both subject areas at ages 13 and 17.

Students who learned to speak Spanish as a native language performed significantly below state performance levels in reading and mathematics at all three ages. Students who did not learn to speak Spanish before learning to speak English scored significantly above state performance levels in reading at all three ages, and they scored significantly above state performance levels in mathematics at ages 13 and 17.

Chapter 4

Overlap Comparisons in Reading and Mathematics

I. INTRODUCTION

The analysis presented in this chapter is concerned with comparing the performance of 9-, 13-, and 17-year-olds on clusters composed of the same items administered at more than one age. The data which are included in Tables 4.1 through 4.10 will be described in terms of their educational and developmental significance, since the primary goal of this analysis is to provide educationally and psychologically meaningful data about changes in performance from the elementary through the high school levels. Hence, those findings that appear to be redundant or that provide little direct information about important performance differences will be summarized briefly and/or included in the appendix sections of this report. Overlap comparisons were made between the following age groups: (1) 9-, 13-, and 17-year-olds; (2) 9- and 13-year-olds; (3) 9- and 17-year-olds; and (4) 13- and 17-year-olds. The reason for making four different age group comparisons was that different clusters of identical assessment items were used for each of these age groups. However, only the data for the 9-, 13-, and 17-year-old, and 9- and 13-year-old comparisons will be described in this chapter because: (1) the greatest developmental changes occurred between ages 9 and 13 years; and (2) these comparisons are similar to the performance results that occurred among the other age groups.

II. OVERLAP COMPARISONS IN READING

The data in Table 4.1 show the average percentage of the 12 identical reading items administered at all 3 age levels, which were answered correctly by the different reporting groups. The data in Table 4.1 also show the performance differences between ages 9 and 13 and between ages 13 and 17. These results are similar to other overlap comparisons which were made

Table 4.1

READING OVERLAP COMPARISONS FOR 9-, 13-, AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 12 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9-13-Year-Olds	13-Year-Olds	Differences[2] 13-17-Year-Olds	17-Year-Olds
TOTAL	52.0%	(27.3%)	79.3%	(8.4%)	87.7%
SEX					
Males	50.5	(27.8)	78.4	(7.6)	86.0
Females	58.8	(21.7)	80.5	(8.8)	89.3
RACE					
Black	41.5	(22.8)	64.3	(7.8)	72.1
Non-Black	54.9	(27.8)	82.7	(8.6)	91.3
SIZE/TYPE OF COMMUNITY					
Large City	46.1	(28.2)	74.3	(9.8)	84.1
Urban Fringe	54.2	(27.8)	82.0	(5.8)	87.8
Rural	51.9	(25.6)	77.5	(11.5)	89.0
PARENT'S EDUCATION					
Less Than High School	46.4	(26.3)	72.7	(4.6)	77.3
High School Graduates	53.3	(23.9)	77.2	(8.0)	85.2
Post High School	56.1	(21.1)	85.2	(6.9)	92.1
READING MATERIALS IN HOME					
Limited Availability	46.3	(20.1)	66.4	(10.7)	77.1
Medium Availability	52.2	(23.5)	75.7	(5.9)	81.6
Wide Range Availability	56.2	(27.9)	84.1	(7.1)	91.2
SPANISH AS NATIVE LANGUAGE					
Yes	46.7	(26.8)	73.5	(7.6)	81.1
No	52.3	(27.4)	79.7	(8.2)	87.9

1/ Average percent correct for 13-year-olds minus average percent correct for 9-year-olds.

2/ Average percent correct for 17-year-olds minus average percent correct for 13-year-olds.

in this study for the 9- and 13-year-olds, 9- and 17-year-olds, and 13- and 17-year-olds (see Appendix A-4 for these comparisons). It is clear from this table that the largest changes in performance occurred between ages 9 and 13 and that certain differences between reporting groups appeared which are generally found in studies making similar comparisons of reading performance. At each age level the performance differences within sex, race, size and type of community, parents' education, reading materials in home, and Spanish as a native language were consistent with the results in Chapter 3.

It appears that the most educationally important findings are concerned with the Black versus non-black and Spanish as a Native Language comparisons because these results provide educators with information about the specific reading and mathematics deficiencies that were found among these groups. The Black versus non-black results which are presented in Table 4.1 show that the percentage differences between these groups increased from ages 9 to 17.

The comparisons (in Table 4.1) between children who learned to speak Spanish as a native language and those who did not show that, although the former group is consistently lower in performance than the latter group at all three age levels, relatively small differences exist between these groups in terms of their average percentage of items answered correctly, and these differences do not increase significantly with age. The actual percentage differences for 9-, 13-, and 17-year-olds were 5.6%, 6.2%, and 6.8%. In contrast, the Black and non-black differences for these age levels were 13.4%, 18.4%, and 19.2%.

In order to further specify the Black and non-black percentage differences, comparisons were made between these groups according to the various reading themes. However, these comparisons are only discussed for the 9- and 13-year-old overlap data because this represents the period during which the greatest developmental changes occurred in reading performance. In addition, the rankings of the themes (in terms of the average percentage of items answered correctly) are similar for the 9-, 13-, and 17-year-old overlap comparisons, and for the 13- and 17-year-old overlap comparisons. Table 4.2 presents the results of these comparisons, and Table 4.3 shows the magnitude of the Black and non-black differences between the themes.

Table 4.2

PERCENTS CORRECT ON 9- AND 13-YEAR-OLD OVERLAP CLUSTERS BY READING THEME AND BY BLACK AND NON-BLACK REPORTING GROUPS

Reading Theme	Percents Correct for 9-Yr.-Old Overlap Data		Percents Correct for 13-Yr.-Old Overlap Data	
	Black	Non-Black	Black	Non-Black
1	52.1%	71.6%	80.6%	92.4%
2	61.7%	76.0%	80.9%	92.4%
4	28.4%	44.9%	55.0%	80.6%
6	21.0%	39.4%	57.4%	89.1%
7	50.1%	63.0%	73.7%	88.0%
8	32.6%	16.5%	36.9%	52.9%

Table 4.3

DIFFERENCES BETWEEN THE CLUSTER PERCENTS CORRECT ON THE BLACK AND NON-BLACK REPORTING GROUPS FOR THE 9- AND 13-YEAR-OLD READING OVERLAP DATA

Reading Theme	Differences Between Percents Correct by Theme	
	9-Year-Olds	13-Year-Olds
1	19.5%	11.8%
2	14.3%	11.4%
4	16.5%	25.6%
6	18.4%	31.7%
7	12.9%	14.3%
8	-16.1%	16.0%

The results presented in these tables indicate that the increase in Black and non-black differences from ages 9 to 13 was primarily caused by performance changes in Themes 4, 6, and 8. Thus, the differences between the two groups on Themes 4 and 6 at age 13 were much greater than at age 9, and a complete reversal in performance occurred from ages 9 and 13 on Theme 8 (i.e, at age 9, Blacks performed higher than the non-blacks on Theme 8, but this situation was reversed at age 13). This initial analysis of the data seems to indicate that the biggest gaps in performance between the Blacks and non-blacks from ages 9 to 13 were related to major differences in the ability to read reference materials (Theme 4), read for main ideas (Theme 6), and read critically (Theme 8). Although the results for Themes 6 and 8 are based upon only one item per theme, these results seem to be consistent because they occurred in the other overlap data included in this study (e.g., 13- and 17-year-old overlap comparisons).

Tables 4.4 and 4.5 present a similar analysis of reading themes for the Spanish and non-Spanish native language students.

It is clear from these tables that the differences between the language groups are smaller than the Black and non-black comparisons, and that these language group differences did not increase as much from 9 to 13 years in comparison to the age level changes which occurred between the Black and non-black groups. For example, the Theme 4 percentage differences between Spanish and non-Spanish speaking 9- and 13-year-olds were 4.6% and 9.4%, while these same differences between the Blacks and non-blacks were 16.5% and 25.6%.

Table 4.4

PERCENTS CORRECT ON 9- AND 13-YEAR-OLD OVERLAP CLUSTERS BY READING THEME AND BY SPANISH AND NON-SPANISH NATIVE LANGUAGE REPORTING GROUPS

Reading	Percents Correct for 9-Yr.-Old Overlap Data		Percents Correct for 13-Yr.-Old Overlap Data	
Theme	Spanish	Non-Spanish	Spanish	Non-Spanish
1	62.9	67.5	81.6	91.0
2	68.8	73.2	85.1	90.7
4	35.9	41.5	71.5	76.3
6	26.5	35.7	73.4	83.9
7	52.9	60.9	83.9	85.4
8	19.6	20.3	38.9	50.9

Table 4.5

DIFFERENCES BETWEEN THE CLUSTER PERCENTS CORRECT ON THE SPANISH AND NON-SPANISH NATIVE LANGUAGE REPORTING GROUPS FOR THE 9- AND 13-YEAR-OLD READING OVERLAP DATA

Reading	Differences Between Cluster Percents Correct	
Theme	9-Year-Olds	13-Year-Olds
1	4.6%	9.4%
2	4.4%	5.6%
4	5.6%	4.8%
6	9.2%	10.4%
7	8.0%	1.4%
8	0.7%	12.0%

III. OVERLAP COMPARISONS IN MATHEMATICS

The data in Table 4.6 show the average percentage of the 8 identical mathematics items administered at all 3 age levels, which were answered correctly by the different reporting groups. The data in Table 4.6 also show the performance differences between ages 9 and 13 and between ages 13 and 17. As with reading, these results are similar to other overlap comparisons which were made in this study for the 9- and 13-year-olds, 9- and 17-year-olds, and 13- and 17-year-olds (see Appendix A-4 for these comparisons).

The results in Table 4.6 for mathematics are similar to those presented in Table 4.1 for reading. Hence, the largest gains in performance occurred between ages 9 and 13, and at each age level the performance differences within sex, race, size and type of community, parents' education, reading materials in home, and Spanish as a native language were consistent with the results for total reading and total mathematics in Chapter 3.

Again, the Black versus non-black differences increased--from 9.0% at age 9 to 20.6% at age 17. The size and rate of these increases were greater for the mathematics items than for the reading items (see Table 4.1), and these differences between the results suggest that the Black children have relatively more deficiencies in mathematics than in reading. However, the Spanish versus non-Spanish language group comparisons for the mathematics results were similar to those for the reading results; i.e., the mathematics differences between these two groups at ages 9, 13, and 17 were relatively small.

An analysis of the mathematics results by objectives is presented in Table 4.7 for the Black and non-black comparisons, and Table 4.8 shows the differences for these groups on each objective, using 9- and 13-year-old overlap data. The reason for reporting the mathematics overlap results by objectives rather than by content areas is because the former categories are more similar to the reading themes; i.e., both objectives and themes represent behavioral indicators of mathematics and reading performance.[1/]

1/ Objective 1, recall or recognition of definitions, facts, and symbols; Objective 2, perform mathematical manipulations; Objective 3, understand mathematical concepts and processes; Objective 4, solving mathematical problems.

Table 4.6

MATHEMATICS TEST OVERLAP COMPARISONS FOR 9-, 13-, AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 8 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9-13-Year-Olds	13-Year-Olds	Differences[2] 13-17-Year-Olds	17-Year-Olds
TOTAL	26.0%	(46.4%)	72.4%	(12.0%)	84.4%
SEX					
Males	25.1	(46.7)	71.8	(12.3)	84.1
Females	27.5	(45.4)	72.9	(12.0)	84.9
RACE					
Black	18.9	(38.8)	57.7	(10.0)	67.7
Non-Black	27.9	(47.7)	75.6	(12.7)	88.3
SIZE/TYPE OF COMMUNITY					
Large City	24.5	(43.9)	68.4	(14.0)	82.4
Urban Fringe	26.8	(47.3)	74.1	(9.1)	83.2
Rural	25.7	(45.7)	71.4	(14.9)	86.3
PARENT'S EDUCATION					
Less Than High School	23.7	(44.5)	68.2	(8.0)	76.2
High School Graduates	28.5	(39.5)	68.0	(13.7)	81.7
Post High School	30.1	(48.4)	78.5	(10.2)	88.7
READING MATERIALS IN HOME					
Limited Availability	21.0	(39.1)	60.1	(13.8)	73.9
Medium Availability	25.6	(41.3)	66.9	(11.5)	78.4
Wide Range Availability	31.3	(47.1)	78.4	(9.7)	88.1
SPANISH AS NATIVE LANGUAGE					
Yes	25.1	(41.8)	66.9	(13.2)	80.1
No	25.9	(46.7)	72.6	(12.0)	84.6

1/ Average percent correct for 13-year-olds minus average percent correct for 9-year-olds.

2/ Average percent correct for 17-year-olds minus average percent correct for 13-year-olds.

Therefore, performance comparisons can be made between objectives and themes in order to determine various reporting groups' relative strengths and weaknesses in these two subject matter areas. These findings are more consistent than the reading test results because they show that the Black and non-black differences were greater for all of the mathematics objectives at age 13 than they were at age 9. In contrast, only three out of six of the reading theme differences increased from ages 9 to 13. These mathematics results are unexpected because the differences between the Black and non-black groups were less at age 9 than were similar differences at this age level on reading. Therefore, it appears that the Black students lost relatively more in mathematics than in reading between ages 9 and 13.

Table 4.7

PERCENTS CORRECT ON 9- AND 13-YEAR-OLD OVERLAP CLUSTERS BY MATHEMATICS OBJECTIVE AND BY BLACK AND NON-BLACK REPORTING GROUPS

Mathematics	Percents Correct for 9-Yr.-Old Overlap Data		Percents Correct for 13-Yr.-Old Overlap Data	
Objective	Blacks	Non-Blacks	Blacks	Non-Blacks
1	16.4%	24.3%	40.0%	67.2%
2	24.3%	36.6%	66.6%	85.1%
3	23.1%	40.1%	36.7%	66.4%
4	16.8%	19.0%	37.1%	61.2%

Table 4.8

DIFFERENCES BETWEEN THE CLUSTER PERCENTS CORRECT ON THE BLACK AND NON-BLACK REPORTING GROUPS FOR THE 9- AND 13-YEAR-OLD MATHEMATICS OVERLAP DATA

Mathematics Objective	Differences Between Percents Correct by Objective	
	9-Year-Olds	13-Year-Olds
1	7.9%	27.2%
2	12.3%	18.6%
3	17.0%	29.7%
4	2.2%	24.5%

The results by mathematics objectives for the Spanish native language comparisons are presented in Tables 4.9 and 4.10. The 9-year-old mathematics results are similar to the reading results for this age level because the group differences were relatively small in both instances. But the 13-year-old results are different because the language group gap was wider for the mathematics objectives than for the reading themes. Hence, the average difference between these groups on the mathematics objectives was 12.0%, and it was 7.2% on the reading themes.

Table 4.9

PERCENTS CORRECT ON 9- AND 13-YEAR-OLD OVERLAP CLUSTERS BY MATHEMATICS OBJECTIVE AND BY SPANISH AND NON-SPANISH NATIVE LANGUAGE REPORTING GROUPS

Mathematics Objective	Percents Correct for 9-Yr.-Old Overlap Data		Percents Correct for 13-Yr.-Old Overlap Data	
	Spanish	Non-Spanish	Spanish	Non-Spanish
1	20.5%	22.6%	45.3%	63.0%
2	30.9%	33.8%	76.6%	81.9%
3	28.1%	36.7%	43.9%	61.5%
4	13.9%	18.8%	49.9%	57.3%

Table 4.10

DIFFERENCES BETWEEN THE CLUSTER PERCENTS CORRECT ON THE SPANISH AND NON-SPANISH NATIVE LANGUAGE REPORTING GROUPS FOR THE 9- AND 13-YEAR-OLD MATHEMATICS OVERLAP DATA

Mathematics Objective	Differences Between Cluster Percents Correct	
	9-Year-Olds	13-Year-Olds
1	2.2%	17.7%
2	2.9%	5.3%
3	8.6%	17.6%
4	4.9%	7.4%

IV. CONCLUSIONS

The educational implications of these comparisons between ethnic and language groups are relatively clear. Both Blacks and Spanish native language students performed below state performance levels, but it appears that the Spanish native language students performed relatively more successfully in the Florida schools than the Black students. If additional educational resources are available for reducing the deficiencies of the Black students, then the Florida educational system should concentrate upon providing further reading instruction and further mathematics instruction in the areas of greatest need.

The findings for the Spanish native language comparisons are interesting from a comparative point of view because they are different from most analyses of educational programs for Spanish speaking children (e.g., Carter, 1970). These previous analyses indicated that greater differences existed between the Spanish and non-Spanish speaking students than seem to have occurred in the present investigation. The reasons concerning why the

Spanish speaking children lost more ground in mathematics at age 13 than in reading are presently unclear. It is possible that these children may attempt to solve mathematics problems in their native language, thus creating a language barrier to solving these problems when they are presented in English. It appears that studies of the children's problem solving behavior might be conducted in order to determine what remedial steps are necessary in order to reduce these deficiencies in mathematics performance.

Chapter 5

Florida Versus National Assessment Comparisons

I. INTRODUCTION

A. Comparison Groups

This chapter contrasts the reading and mathematics performance of Florida 9-, 13-, and 17-year-old students with the performance of students in the Nation and the Southeast Region of the U.S.[1] on items from the National Assessment of Educational Progress (NAEP). At each age level groups of Florida students are also compared to the corresponding groups of students assessed in NAEP, yielding the following comparisons:[2]

1. Comparisons by Sex
   a. Florida males versus U.S. males
   b. Florida females versus U.S. females
2. Comparisons by Race
   a. Florida Blacks versus U.S. Blacks
   b. Florida non-blacks versus U.S. non-blacks
3. Comparisons by Level of Parents' Education
   a. Florida less than high school graduate versus U.S. less than high school graduate. For this group neither parent has graduated from high school.
   b. Florida high school graduate versus U.S. high school graduate. For this group at least one parent has graduated from high school, but neither parent has any formal education after high school.

1/ The states of NAEP's Southeast Region are the same as those used by the Office of Business Economics, Department of Commerce: Arkansas, Florida, Virginia, West Virginia, Alabama, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

2/ More detailed definitions of the reporting groups are presented in Appendix A-1.

c. Florida post high school versus U.S. post high school
For this group at least one parent has some formal education beyond high school, which may include business, professional, or vocational training as well as college or university education.

4. Comparisons by Size and Type of Community
   a. Florida large city versus U.S. large city
   b. Florida urban fringe and medium city versus U.S. urban fringe and medium city
   c. Florida rural versus U.S. rural

These comparisons are made in order to determine the extent of differences in performance between groups of Florida students and corresponding groups of students in the Nation in reading and mathematics. Although this analysis cannot determine the causes of such performance differences, it can point to specific groups of students at each age level whose performance differs significantly in comparison to corresponding national groups; and it can point to specific areas of reading and mathematics where statistically significant performance differences exist between Florida students and those in the Nation and the Southeast.

B. Interpreting the Reading and Mathematics Results

The tables in this chapter show the differences between Florida students and the Nation's students, between Florida students and students in the Southeast, and between groups of Florida students and corresponding groups of students in the Nation, across all reading items and all mathematics items at each age level. These differences, or group effects, were calculated by subtracting the average percent of items answered correctly by the National group from that of the corresponding Florida group. An effect (or difference) was labeled statistically significant (at the .05 level of confidence) if it was at

least twice as large as its associated standard error.[1/] In the tables for this chapter statistical significance is denoted by an asterisk to the right of the effect. Thus, a negative group effect with an asterisk indicates that Florida students in a particular group performed significantly below students in the corresponding National group, while a positive group effect with an asterisk indicates that students in a Florida group significantly outperformed their National peers.

Some rather large effects are sometimes not statistically significant, while some rather small effects are in some instances statistically significant. This is due to the fact that statistical significance is determined by the ratio of the effect to its standard error. In general, items that are of medium difficulty and based upon small samples have large standard errors, while extremely hard or extremely easy items that are based upon large samples have smaller standard errors. These item standard errors are used to calculate standard errors for the average percents of items answered correctly. If a standard error associated with an effect is very large, even a large effect may not be statistically significant. On the other hand, if a standard error of an effect is very small, a small effect may be statistically significant.

The tables in Appendix A-5 present differences between Florida students and the Nation's students and between Florida students and Southeast students for each reading theme and each mathematics content area. The differences and statistical significances in the tables in Appendix A-5 were calculated as they were for the tables in this chapter.

1/ The National Assessment multiple matrix sample design provided for the administration of some items to the same students during NAEP administration, while other items were administered to different students from other independent probability samples. Data were not available from NAEP to precisely compute standard errors for the average percents of items answered correctly, taking into account all covariance components associated with the NAEP matrix sample design. RTI calculated the statistical significance assuming minimal effects of covariance and estimated the statistical significance assuming large covariance effects. Those differences which exhibited statistical significance assuming minimal effects of covariance on NAEP items but which did not exhibit statistical significance assuming large effects of covariance on NAEP items are footnoted in the tables.

The reader should be cautious in interpreting the results. The NAEP reading performance data were collected in 1970-71, and the NAEP mathematics performance data were collected in 1972-73; both the reading and mathematics performance data for Florida were collected in 1974-75. It is possible that the time factor has affected the results in some unknown way; for example, if National reading performance has decreased since 1970-71, Florida would be doing relatively better than these reading results suggest. NAEP has not yet reported results on second cycles in reading or mathematics; therefore, it is not possible to precisely determine the effects of time on reading or mathematics performance.[1/]

Both NAEP and Florida report results for 9-, 13-, and 17-year-olds, and the grade distributions of these students vary for the National and Florida samples. These varying grade distributions affect assessment results, as evidenced in assessment studies conducted for the Nation and other states; at all three age levels students who are in higher grades perform substantially better than those who are in lower grades. Table 5.1 shows the approximate percentages of 9-, 13-, and 17-year-olds in the various grades for the National Assessment and for the Florida replication. In general, Florida students at each age level have had a little more schooling than students across the Nation, with this difference in the amount of schooling decreasing as age increases.

1/ NAEP has reported preliminary results for a small subset of 1970-71 reading exercises measuring functional literacy skills at the 17-year-old age level. On these 64 items, which were administered during NAEP's 1973-74 assessment, the average percent correct did increase by about two percent. Since these items were a special subset of items which measure functional literacy and which are generally easier than the entire set of reading items, and since National Assessment has not yet reported standard errors and statistical significance for the comparisons, it is not possible to precisely determine the effects of time on 17-year-old reading performance. The results of this study are available in Right to Read: Functional Literacy - Basic Reading Performance--Technical Summary, The National Assessment of Educational Progress, Denver, Colorado, 1975.

Table 5.1

APPROXIMATE PERCENT OF STUDENTS BY GRADE FOR FLORIDA VERSUS NAEP BY AGE LEVEL*

	Age 9		Age 13		Age 17		
Grade →	3	4	7	8	10	11	12
Florida %	14	85	22	76	14	68	17
National %	24	74	26	70	14	72	12

* A small percent of students are in other grades; therefore, the percents do not total 100%.

The reader should be careful not to infer causality from the reading and mathematics performance results. The fact that Florida students surpassed the Nation's students or failed to perform as well does not necessarily mean that Florida's schools are causing the differences in performance. Community, family background, and personal characteristics of Florida students certainly effect reading and mathematics performance results.

II. READING RESULTS

A. Reading Results at Age 9

There were 50 reading items administered to 9-year-olds, and Table 5.2 presents the performance results across these items. Florida 9-year-olds performed significantly and substantially below the Nation's 9-year-olds and performed very near the performance level of 9-year-olds in the Southeast.

Both Florida males and females performed below their National counterparts, but Florida females did somewhat better than males when compared to their counterparts. Florida Blacks performed very near the performance level of National Blacks while Florida non-blacks performed below their corresponding National group.

Table 5.2

FLORIDA VERSUS NATIONAL ASSESSMENT READING RESULTS BY AGE LEVEL
USING AVERAGE PERCENT OF ITEMS CORRECT ON ALL READING ITEMS

Age 9 (50 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
69.77	64.54	-5.23*	67.90	61.53	-6.37*	52.03	51.69	-.34	62.02	57.89	-4.13	64.79	60.14	-4.65*
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
63.57	64.54	.97	71.64	68.17	-3.47*	72.00	68.05	-3.95*	70.49	65.32	-5.17*	73.55	67.21	-6.34*
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									77.17	69.30	-7.87*	68.56	63.03	-5.53*

Age 13 (62 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
75.57	78.10	2.53*	73.24	76.17	2.93*	60.37	63.85	3.48	68.24	72.83	4.59*[1/]	71.98	73.82	1.84
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
70.31	78.10	7.79*	77.89	80.27	2.38*	77.87	81.26	3.39*	76.37	76.52	.15	78.35	80.50	2.15*[1/]
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									81.53	83.22	1.69*[1/]	74.02	76.27	2.25

Age 17 (61 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
78.18	79.58	1.40*[1/]	76.08	76.82	.74	62.92	64.65	1.73	70.83	69.07	-1.76	76.87	77.49	.62
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
72.95	79.58	6.63*	80.23	82.31	2.08*	79.85	83.07	3.22*	77.99	76.67	-1.32	80.64	79.37	-1.27
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									83.13	84.66	1.53*	76.31	80.65	4.34*

* Denotes statistical significance of the .05 level of confidence, assuming maximal effects of covariance on NAEP items.

*[1/] Denotes statistical significance at the .05 level of confidence, assuming minimal effects of covariance, but loss of statistical significance assuming maximal effects of covariance.

In terms of parent education levels, both the "high school graduate" group and the "post high school graduate" group performed significantly and substantially below corresponding National groups. All size and type of community groups performed well below their National counterparts.

Appendix A-1 materials show that Florida students performed significantly below the Nation on all eight reading themes except Themes 2 and 5 (Visual Aids and Significant Facts). Compared to students in the Southeast, Florida 9-year-olds performed significantly better on Theme 2 (Visual Aids) and significantly worse on Theme 4 (Reference Materials).

B. Reading Results at Age 13

There were 62 reading items administered to 13-year-olds, and Table 5.2 presents the performance results across these items. Florida 13-year-olds performed significantly above the Nation's 13-year-olds, and they performed significantly and substantially above the Southeast.

Both Florida males and females performed above their National counterparts. Florida non-blacks performed above non-blacks in the Nation, while Florida Blacks did not perform significantly different than National Blacks.

In terms of parent education levels, both the "less than high school graduate" group and the "post high school graduate" group performed somewhat above the corresponding National groups. In the size and type of community classifications, only students in the Florida "urban fringe and medium city" group performed significantly different than their National counterparts, performing above the National group.

Appendix A-1 materials show that Florida students performed significantly above the Nation on Reading Themes 2, 3, and 7 (Visual Aids, Following Directions, and Drawing Inferences). Compared to students in the Southeast, Florida 13-year-olds performed significantly and substantially better on all reading themes except Theme 1 (Word Meanings).

C. Reading Results at Age 17

There were 61 reading items administered to 17-year-olds, and Table 5.2 presents the performance results across these items. Florida 17-year olds

performed significantly above the Nation's 17-year-olds and significantly and substantially above 17-year-olds in the Southeast.

Florida females did relatively better than males in the 17-year-old comparisons as they performed significantly better than females in the Nation while Florida males performed near the average for the Nation's males. Florida Blacks performed near the performance level of National Blacks while Florida non-blacks performed significantly better than their National peers.

In terms of parent education levels the "post high school graduate" group performed significantly above their National peers, while the other two groups did not perform different than their corresponding National groups. Among the size and type of community groups the Florida rural group performed significantly above National rural students, and the other two groups performed near the performance levels of the corresponding National groups.

Appendix A-1 materials show that Florida 17-year-olds performed significantly above the Nation on Reading Themes 2 and 3 (Visual Aids and Following Directions). Compared to the Southeast, Florida students performed significantly better on all themes except Theme 1 (Word Meanings).

III. MATHEMATICS RESULTS

A. Mathematics Results at Age 9

There were 55 math items administered to 9-year-olds, and Table 5.3 presents the performance results across these items. Florida 9-year-olds performed significantly below the Nation's 9-year-olds, and they performed significantly above their counterparts in the Southeast.

Both Florida males and females performed significantly below their National counterparts. Florida Blacks performed near the average for National Blacks while Florida non-blacks performed significantly below their National peers.

In terms of parent education levels, all three reporting groups performed significantly below corresponding National groups with the

Table 5.3

FLORIDA VERSUS NATIONAL ASSESSMENT MATHEMATICS RESULTS BY AGE LEVEL
USING AVERAGE PERCENT OF ITEMS CORRECT ON ALL MATHEMATICS ITEMS

Age 9 (55 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
49.40	45.15	-4.25*	49.72	44.87	-4.85*	34.30	35.83	1.53	44.03	41.25	-2.78*[1]	43.62	41.62	-2.0
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
42.91	45.15	2.24*[1]	49.07	45.75	-3.32*	52.10	47.70	-4.40*	50.64	46.68	-3.96*	53.94	46.75	-7.19*
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									56.04	49.48	-6.55*	48.21	44.67	-3.54*[1]

Age 13 (74 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
49.68	47.98	-1.70	50.04	47.96	-2.04	29.61	31.44	1.83	39.89	40.51	.62	42.30	41.25	-1.05
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
44.21	47.98	3.77*	49.36	47.94	-1.42	52.74	51.64	-1.10	49.32	44.51	-4.81*	54.33	50.65	-3.68*
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									58.08	55.00	-3.08*	48.87	46.78	-2.09

Age 17 (78 items)

NATION/SOUTHEAST			SEX			RACE			PARENT EDUCATION			SIZE/TYPE OF COMMUNITY		
US	Fla	Fla Effect	US Male	Fla Male	Fla Effect	US Black	Fla Black	Fla Effect	US No Grad	Fla No Grad	Fla Effect	US Lg City	Fla Lg City	Fla Effect
60.20	58.25	-1.95	62.94	59.46	-3.48*	37.16	32.65	-4.51*	47.64	39.53	-8.11*	51.69	53.70	2.01
SE	Fla	Fla Effect	US Fem	Fla Fem	Fla Effect	US Non-Bl	Fla Non-Bl	Fla Effect	US HS Grad	Fla HS Grad	Fla Effect	US Urb/Med	Fla Urb/Med	Fla Effect
54.69	58.25	3.56*[1]	57.62	57.44	-.18	63.26	64.21	.95	58.27	53.34	-4.93*	64.99	57.31	-7.68*
									US PostGrad	Fla PostGrad	Fla Effect	US Rural	Fla Rural	Fla Effect
									68.61	66.76	-1.85	59.83	61.04	1.21

* Denotes statistical significance of the .05 level of confidence, assuming maximal effects of covariance on NAEP items.

*[1] Denotes statistical significance at the .05 level of confidence, assuming minimal effects of covariance, but loss of statistical significance assuming maximal effects of covariance.

"post high school" group performing substantially below their National peers. Florida's "large city" students performed near the performance level of their National peers; Florida "rural" students performed significantly below the corresponding size and type of community group nationally; and the Florida "urban fringe and medium city" group performed significantly and substantially below the corresponding National group.

Appendix A-1 materials show that Florida 9-year-olds performed significantly below the Nation in all seven Mathematics Content Areas measured with the exception of Content Area H (Equations).[1/] Compared to students in the Southeast, Florida 9-year-olds performed better on Content Areas H, K, and Q (Equations, Geometry, and Graphs).

B. Mathematics Results at Age 13

There were 74 math items administered to 13-year-olds, and Table 5.3 presents the performance results across these items. Florida 13-year-olds performed similar to their National peers, and they performed significantly above their counterparts in the Southeast.

Florida males and females did not perform significantly different from their National counterparts, nor did Florida Blacks and non-blacks. In terms of parent education levels, the Florida "less than high school graduate" group performed near the average for their National counterparts while students from the "high school graduate" and the "post high school graduate" groups performed significantly below corresponding National groups.

In the size and type of community categories, the Florida "urban fringe and medium city" group performed significantly below their National counterparts while the other groups did not perform significantly different than corresponding National groups.

Appendix A-1 materials show that Florida 13-year-olds performed significantly below the Nation on Mathematics Content Areas B, E, and K (Properties of Numbers, Estimation, and Geometry) while not performing

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1/ Note that Content Area H (Equations) contains only two items at the 9-year-old level.

significantly different than the Nation on the other 10 content areas measured at age 13. Compared to students in the Southeast, Florida 13-year-olds performed significantly better on Mathematics Content Areas A, C, D, F, G, H, J, and Q (Number Concepts, Computation, Sets, Exponents and Logarithms, Algebra, Equations, Probability, and Geometry).[1/]

C. Mathematics Results at Age 17

There were 78 math items administered to 17-year-olds, and Table 5.3 presents the performance results across these items. Florida 17-year-olds did not perform significantly different than their National peers, but they did perform significantly above their Southeastern counterparts.

Florida males performed significantly below National males, while Florida females performed very near the performance level of females in the Nation. Florida Blacks performed significantly below National Blacks, while non-blacks in Florida did not perform significantly different than their National counterparts.

In terms of parent education levels, students in Florida's "less than high school graduate" group performed significantly and substantially below their National peers; students in Florida's "high school graduate" group performed significantly below their National counterparts; and students in the "post high school" group performed near the average of students in the corresponding National group. Students in the "urban fringe and medium city" group performed significantly and substantially below their National peers, while students in other size and type of community groups did not perform significantly different than students in their corresponding National groups.

Appendix A-1 materials show that Florida 17-year-olds performed significantly below the Nation in Mathematics Content Areas A, B, and K (Number Concepts, Properties of Numbers, and Geometry) while not performing significantly different than the Nation on the other 11 content areas

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1/ Note that Content Area G (Algebra) contains only two items at the 13-year-old level.

measured at age 17. Compared to the Southeast, Florida students performed significantly better on Content Areas E, G, H, I, N, and Q (Estimation, Algebra, Equations, Functions, Logic, and Graphs).[1/]

IV. SUMMARY OF FLORIDA VERSUS NAEP COMPARISONS

A. Summary of Reading Comparisons

Compared to the Nation, Florida students performed significantly below their National peers at Age 9 but significantly above them at ages 13 and 17. Compared to students in the Southeast, Florida students performed similar to them at age 9 but significantly and substantially above them at ages 13 and 17.

Compared to their National peers, Florida males performed significantly and substantially below them at age 9, significantly above them at age 13, and very much like them at age 17. Florida females performed significantly below their National counterparts at age 9, and significantly above them at ages 13 and 17. Florida Blacks did not perform significantly different than National Blacks at any age level, while Florida non-blacks performed significantly below students in the corresponding National group at age 9 but significantly above them at ages 13 and 17. In terms of both parental education level and size and type of community, relative performance of the reporting groups was very inconsistent across age levels.

In terms of reading content, Florida students surpassed their National and Southeastern counterparts most consistently in Reading Themes 2 and 3 (Visual Aids and Following Directions).

B. Summary of Mathematics Comparisons

Compared to the Nation, Florida students performed significantly below their National peers at age 9 and similar to their National peers at ages 13 and 17. Florida students at all three age levels performed significantly above their counterparts in the Southeast.

1/ Note that Content Areas I (Functions) and N (Logic) contain only two items at the 17-year-old level.

Compared to their National counterparts, Florida males performed significantly below them at ages 9 and 17, and the performance levels did not differ significantly at age 13. Florida females performed significantly below their National peers at age 9, and the performance levels did not differ significantly at ages 13 and 17. Florida Blacks did not perform significantly different than National Blacks at ages 9 and 13, but they did perform significantly below National Blacks at age 17. Florida non-blacks performed significantly below their National counterparts at age 9, but they did not perform significantly different than National non-blacks at ages 13 and 17.

In terms of parental education classifications, the "high school graduate" group performed significantly below their National peers at every age level, while the performance of the other two groups was more inconsistent. Within the size and type of community classifications, Florida's "urban fringe and medium city" students consistently performed well below their National peers.

In terms of mathematics content, Florida students appeared to have the most consistent trouble with Mathematics Content Areas B and K (Properties of Numbers and Geometry).

Appendix 1

Description of Reporting Variables and Reporting Groups

Description of Reporting Variables and Reporting Groups

1. Sex
   a. Data Source: Student Questionnaire Item No. 1.
   b. Two Reporting Groups:
      1) Male
      2) Female

2. Race
   a. Data Source: Response Code on Reading Assessment Booklet Cover.
   b. Two Reporting Groups:
      1) Black
      2) Non-black

3. Size and Type of Community
   a. Description: Size and Type of Community refers to the size and type of community in which the student attends school. Each student's classification was determined using the principal's report of the percentages of enrolled students living in areas with certain population sizes and the percentages of enrolled students having parents in certain occupational categories.
   b. Data Source: School Questionnaire Items No. 2 and No. 3
   c. Three Reporting Groups: 1/
      1) Large City--This group represents students attending schools in a city area with a population of 200,000 or more, with a high proportion of adults not regularly employed or on welfare, and with a low proportion of adults employed in professional or managerial positions.

1/ The definitions for the three reporting groups are overviews of the more detailed definitions which are available from the Florida Department of Education.

2) Urban Fringe and Medium City--This group represents students attending schools in a within-city or near-city area with a population of 25,000 or more, with a high proportion of adults employed in professional and managerial positions, and with a low proportion of adults employed in factories and in agriculture.

3) Rural--This group represents students attending schools in a rural area with a population of less than 25,000, with a high proportion of adults employed in factories and in agriculture, and with a low proportion of adults employed in professional and managerial positions.

4. Parents' Education

a. Description: Parents' Education refers to the highest educational level attained by either parent.

b. Data source: Student Questionnaire Items No. 6 and No. 7.

c. Four Reporting Groups:

1) Less than High School--This group represents students whose parents did not complete the eigth grade, students whose parents completed the eigth grade but did not go to high school, and students whose parents went to high school but did not graduate.

2) High School Graduate--This group represents students having at least one parent who had graduated from high school.

3) Post High School--This group represents students having at least one parent who had some education after graduation from high school.

4) Unknown-- This group represents students who did not respond to or who responded "I don't know" to either of the two Student Questionnaire items.

5. Reading Materials in Home

a. Description: Reading Materials in Home refers to the availability of four different types of reading materials found in the student's home: newspapers, magazines, books and encyclopedia.

b. Data Source: Student Questionnaire Items No. 2, No. 3, No. 4 and No. 5.

c. Three Reporting Groups:

1) Limited Availability--This group represents students having none or one of the four types of reading materials available in the home.

2) Medium Availability--This group represents students having two or three of the four types of reading materials available in the home.

3) Wide-Range Availability--This group represents students having all four types of reading materials available in the home.

6. Spanish as a Native Language

a. Description: Spanish as a Native Language refers to whether or not the student learned to speak Spanish before he/she learned to speak English. School Administrators asked each student the question "What is your native language?"

b. Data Source: Response Code on Reading Assessment Booklet Cover.

c. Two Reporting Groups:

1) Yes--This group represents those students who learned to speak Spanish first, and includes those students who were in the English as a Second Language Program.

2) No--This group represents those students who did not learn to speak Spanish first.

Appendix 2

Student and School Questionnaires

STUDENT QUESTIONNAIRE

QUESTIONS ABOUT YOU

9-, 13-, and 17-Year-Olds

1. Are you a

   ⬭ boy?
   ⬭ girl?

2. Does your family get a newspaper regularly?

   ⬭ Yes
   ⬭ No

   ⬭ I don't know.

3. Does your family get any magazines regularly?

   ⬭ Yes
   ⬭ No

   ⬭ I don't know.

4. Are there more than 25 books in your home?

   ⬭ Yes
   ⬭ No

   ⬭ I don't know.

5. Is there an encyclopedia in your home?

   ⬭ Yes
   ⬭ No

   ⬭ I don't know.

6. How much school did your father complete?
(FILL IN THE ONE OVAL which best shows how much school your father completed.)

- ⬭ Did not complete the 8th grade
- ⬭ Completed the 8th grade, but did not go to high school
- ⬭ Went to high school, but did not graduate from high school
- ⬭ Graduated from high school
- ⬭ Some education after graduation from high school

- ⬭ I don't know.

7. How much school did your mother complete?
(FILL IN THE ONE OVAL which best shows how much school your mother completed.)

- ⬭ Did not complete the 8th grade
- ⬭ Completed the 8th grade, but did not go to high school
- ⬭ Went to high school, but did not graduate from high school
- ⬭ Graduated from high school
- ⬭ Some education after graduation from high school

- ⬭ I don't know.

FLORIDA NATIONAL ASSESSMENT REPLICATION (NAR)

1974-75

SCHOOL QUESTIONNAIRE

9-, 13-, and 17-Year-Olds

SCHOOL LABEL

PLEASE PRINT

Name of School Principal: _____

Type of School: Public _____ Nonpublic _____

Grade Range of School: _____ through _____

1. What is the current enrollment by grade of your school (1974-75 school year)?

Grade	K	1	2	3	4	5	6	7	8	9	10	11	12
Enrollment													

2. Approximately what percentage of the students attending your building live in each of the following areas?

____% A In a rural area (less than 2,500)

____% B In a town of 2,500 to 10,000

____% C In a town of 10,000 to 25,000

____% D In a city of 25,000 to 200,000

____% E In the suburbs of a city of 25,000 to 200,000

____% F In the inner part of a city over 200,000

____% G In the residential area within the city limits of a city over 200,000

____% H Outside the city limits of a city over 200,000 but within the residential area served by the city

100% (Items A-H should add to 100%)

PLEASE TURN PAGE

3. Approximately what percentage of the students attending your building are children of

____% A Professional or managerial personnel

____% B Sales, clerical, technical or skilled workers

____% C Factory or other blue collar workers

____% D Farm workers

____% E Not regularly employed

____% F On welfare

100% (Items A-F should add to 100%)

Appendix 3

Sample Sizes by Age, Subject Area, and Reporting Groups

SAMPLE SIZES BY AGE, SUBJECT AREA, AND REPORTING GROUP

	Age 9		Age 13		Age 17	
	Rdg.	Math	Rdg.	Math	Rdg.	Math
FLORIDA*	1441	1435	1448	1445	1376	1375
SEX						
Male	757	754	741	737	671	665
Female	682	673	706	704	704	700
RACE						
Black	502	503	395	391	430	428
Non-Black	939	932	1052	1053	946	947
SIZE/TYPE OF COMMUNITY						
Large City	401	398	371	369	315	316
Urb. Fringe/Med. City	563	563	670	668	634	633
Rural	477	474	407	408	427	426
PARENTS' EDUCATION						
Less than H. S. Grad.	186	182	252	252	309	307
High School Grad.	330	327	378	377	390	385
Post High School	351	349	542	537	595	592
Unknown	574	577	276	279	82	91
RDG. MATERIALS IN HOME						
Limited Avail.	273	275	149	149	98	107
Medium Avail.	894	886	723	722	636	634
Wide-Range Avail.	274	274	556	551	642	634
SPANISH NATIVE LANG.*						
Yes	497	498	530	532	511	514
No	1045	1040	972	967	897	894

*At each age level a few students in ESL classes were administered assessment booklets. These students were only included in the analysis for the reporting group "Yes" under Spanish as a Native Language. Therefore, the Florida sample size and the Spanish Native Language sample sizes differ.

Appendix 4

Reading and Mathematics Overlap Comparisons for 9- and 13-Year-Olds, 13- and 17-Year-Olds, and 9- and 17-Year-Olds

READING OVERLAP COMPARISONS FOR 9- AND 13-YEAR-OLDS:
AVERAGE PERCENTAGE OF 20 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9- and 13-Year-Olds	13-Year-Olds
TOTAL	56.4%	(26.3%)	82.7%
SEX			
Males	54.6	(27.1)	81.7
Females	58.7	(25.2)	83.9
RACE			
Black	45.5	(22.6)	68.1
Non-Black	59.4	(26.5)	85.9
SIZE/TYPE OF COMMUNITY			
Large City	51.6	(27.1)	78.7
Urban Fringe	58.8	(25.8)	84.6
Rural	55.6	(26.0)	81.6
PARENT'S EDUCATION			
Less Than High School	50.5	(25.1)	75.6
High School Graduate	57.9	(23.2)	81.1
Post High School	61.1	(26.7)	87.8
READING MATERIALS IN HOME			
Limited Availability	50.5	(19.1)	69.6
Medium Availability	56.7	(22.6)	79.3
Wide Range Availability	60.3	(27.0)	87.3
SPANISH AS NATIVE LANGUAGE			
Yes	51.6	(25.6)	77.2
No	56.7	(26.4)	83.1

1/ Average percentage correct for 13-year-olds minus average percentage correct for 9-year-olds.

READING OVERLAP COMPARISONS FOR 13- AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 40 IDENTICAL ITEMS ANSWERED CORRECTLY

	13-Year-Olds	Differences[1/] 13- and 17-Year-Olds	17-Year-Olds
TOTAL	73.5%	(9.3%)	82.8%
SEX			
Males	71.1	(8.8)	79.9
Females	76.1	(9.4)	85.5
RACE			
Black	57.9	(9.3)	67.2
Non-Black	76.9	(9.5)	86.4
SIZE/TYPE OF COMMUNITY			
Large City	67.8	(12.6)	80.4
Urban Fringe	76.6	(5.9)	82.5
Rural	71.1	(12.8)	83.9
PARENT'S EDUCATION			
Less Than High School	57.4	(14.2)	71.6
High School Graduate	71.4	(8.5)	79.9
Post High School	79.4	(8.5)	87.9
READING MATERIALS IN HOME			
Limited Availability	60.9	(7.7)	68.6
Medium Availability	68.9	(6.4)	75.3
Wide Range Availability	79.0	(8.2)	87.2
SPANISH AS NATIVE LANGUAGE			
Yes	66.0	(7.8)	73.8
No	73.9	(9.2)	83.1

1/ Average percentage correct for 17-year-olds minus average percentage correct for 13-year-olds.

READING OVERLAP COMPARISONS FOR 9- AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 14 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9- and 17-Year-Olds	17-Year-Olds
TOTAL	53.6%	(35.1%)	88.7%
SEX			
Males	51.9	(35.4)	87.3
Females	55.7	(34.5)	90.2
RACE			
Black	43.0	(30.9)	73.9
Non-Black	56.5	(35.7)	92.2
SIZE/TYPE OF COMMUNITY			
Large City	47.9	(37.7)	85.6
Urban Fringe	55.7	(33.0)	88.7
Rural	53.6	(36.5)	90.1
PARENT'S EDUCATION			
Less Than High School	48.4	(30.5)	78.9
High School Graduate	54.9	(31.4)	86.3
Post High School	57.9	(35.1)	93.0
READING MATERIALS IN HOME			
Limited Availability	47.9	(30.4)	78.3
Medium Availability	53.8	(29.5)	83.3
Wide Range Availability	57.6	(34.3)	91.9
SPANISH AS NATIVE LANGUAGE			
Yes	48.1	(34.0)	82.1
No	52.9	(36.0)	88.9

[1] Average percentage correct for 17-year-olds minus average percentage correct for 9-year-olds.

MATHEMATICS OVERLAP COMPARISONS FOR 9- AND 13-YEAR-OLDS:
AVERAGE PERCENTAGE OF 17 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9- and 13-Year-Olds	13-Year-Olds
TOTAL	28.5%	(42.7%)	71.2%
SEX			
Males	28.4	(42.8)	71.2
Females	28.7	(42.5)	71.2
RACE			
Black	21.1	(32.1)	53.2
Non-Black	30.5	(44.7)	75.2
SIZE/TYPE OF COMMUNITY			
Large City	25.9	(39.4)	65.3
Urban Fringe	29.3	(44.2)	73.5
Rural	28.5	(41.8)	70.3
PARENT'S EDUCATION			
Less Than High School	26.5	(38.3)	64.8
High School Graduate	30.7	(37.0)	67.7
Post High School	32.1	(45.7)	77.8
READING MATERIALS IN HOME			
Limited Availability	23.3	(34.6)	57.9
Medium Availability	27.9	(38.0)	65.9
Wide Range Availability	34.3	(43.1)	77.4
SPANISH AS NATIVE LANGUAGE			
Yes	24.9	(38.5)	63.4
No	28.4	(43.2)	71.6

[1] Average percentage correct for 13-year-olds minus average percentage correct for 9-year-olds.

MATHEMATICS OVERLAP COMPARISONS FOR 13- AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 53 IDENTICAL ITEMS ANSWERED CORRECTLY

	13-Year-Olds	Differences[1] 13- and 17-Year-Olds	17-Year-Olds
TOTAL	43.4%	(20.4%)	63.8%
SEX			
Males	43.5	(21.3)	64.8
Females	43.4	(19.9)	63.3
RACE			
Black	28.3	(10.2)	38.5
Non-Black	46.8	(22.9)	69.7
SIZE/TYPE OF COMMUNITY			
Large City	36.9	(22.7)	59.6
Urban Fringe	46.1	(16.9)	63.0
Rural	42.3	(24.1)	66.4
PARENT'S EDUCATION			
Less Than High School	35.9	(10.3)	46.2
High School Graduate	40.1	(19.0)	59.1
Post High School	50.3	(21.6)	71.9
READING MATERIALS IN HOME			
Limited Availability	30.5	(17.4)	47.9
Medium Availability	37.7	(15.5)	53.2
Wide Range Availability	49.9	(20.3)	70.2
SPANISH AS NATIVE LANGUAGE			
Yes	34.3	(20.1)	54.4
No	43.9	(20.4)	64.3

1/ Average percentage correct for 17-year-olds minus average percentage correct for 13-year-olds.

MATHEMATICS OVERLAP COMPARISONS FOR 9- AND 17-YEAR-OLDS:
AVERAGE PERCENTAGE OF 8 IDENTICAL ITEMS ANSWERED CORRECTLY

	9-Year-Olds	Differences[1] 9- and 17-Year-Olds	17-Year-Olds
TOTAL	26.0%	(58.4%)	84.4%
SEX			
Males	25.1	(59.0)	84.1
Females	27.5	(57.4)	84.9
RACE			
Black	18.9	(49.0)	67.9
Non-Black	27.9	(60.4)	88.3
SIZE/TYPE OF COMMUNITY			
Large City	24.5	(57.9)	82.4
Urban Fringe	26.8	(56.4)	83.2
Rural	25.7	(60.6)	86.3
PARENT'S EDUCATION			
Less Than High School	23.7	(52.5)	76.2
High School Graduate	28.5	(53.2)	81.7
Post High School	30.1	(58.6)	88.7
READING MATERIALS IN HOME			
Limited Availability	21.0	(52.9)	73.9
Medium Availability	25.7	(52.7)	78.4
Wide Range Availability	31.3	(56.8)	88.1
SPANISH AS NATIVE LANGUAGE			
Yes	25.1	(55.0)	80.1
No	25.9	(58.7)	84.6

[1] Average percentage correct for 17-year-olds minus average percentage correct for 9-year-olds.

Appendix 5

Florida Versus National and Southeast Reading Results by Theme and Mathematics Results by Content Area for Ages 9, 13, and 17

FLORIDA VERSUS NATIONAL AND SOUTHEAST READING RESULTS FOR 9-YEAR-OLDS
BY READING THEME USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Reading Theme	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
1	3	84.40	79.82	-4.58*	77.77	79.82	2.05
2	11	75.60	74.61	-0.99	69.27	74.61	5.34*
3	4	84.80	81.27	-3.53*	79.57	81.27	1.70
4	7	54.47	41.33	-13.14*	49.03	41.33	-7.70*
5	6	62.10	60.27	-1.83	58.42	60.27	1.85
6	6	72.38	66.03	-6.35*	64.28	66.03	1.75
7	6	71.47	65.87	-5.60*	63.95	65.87	1.92
8	7	63.91	57.05	-6.86*	57.40	57.05	-0.35
TOTAL	50	69.77	64.54	-5.23*	63.57	64.54	0.97

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

FLORIDA VERSUS NATIONAL AND SOUTHEAST MATHEMATICS RESULTS FOR 9-YEAR-OLDS
BY MATHEMATICS CONTENT AREA USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Mathematics Content Area	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
A	10	54.66	49.40	-5.26*	46.50	49.40	2.90
B	8	68.71	66.86	-1.85*	65.38	66.86	1.48
C	15	35.76	31.01	-4.75*	28.68	31.01	2.33
E	6	45.97	38.75	-7.22*	40.46	38.75	-1.71
H	2	69.51	68.00	-1.51	63.49	68.00	4.51*
K	11	39.61	36.13	-3.48*	32.85	36.13	3.28*
Q	3	77.81	74.41	-3.40*	70.26	74.41	4.15*[1/]
TOTAL	55	49.40	45.15	-4.25*	42.91	45.15	2.24*[1/]

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

*[1/] Denotes statistical significance at the .05 level of confidence assuming minimal effects of covariance, but loss of statistical significance assuming large effects of covariance.

FLORIDA VERSUS NATIONAL AND SOUTHEAST READING RESULTS FOR 13-YEAR-OLDS
BY READING THEME USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Reading Theme	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
1	3	81.70	81.50	-0.20	78.67	81.50	2.83
2	16	74.15	78.79	4.64*	69.35	78.79	9.44*
3	10	80.53	82.83	2.30*	75.39	82.83	7.44*
4	9	76.16	77.57	1.41	68.00	77.57	9.57*
5	12	79.69	81.73	2.04	75.22	81.73	6.51*
6	3	60.80	61.34	0.54	54.33	61.34	7.01*
7	4	76.62	81.51	4.89*	72.35	81.51	9.16*
8	5	63.56	63.95	0.39	58.50	63.95	5.45*
TOTAL	62	75.57	78.10	2.53*	70.31	78.10	7.79*

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

FLORIDA VERSUS NATIONAL AND SOUTHEAST MATHEMATICS RESULTS FOR 13-YEAR-OLDS
BY MATHEMATICS CONTENT AREA USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Mathematics Content Area	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
A	6	42.78	42.13	-0.65	37.56	42.13	4.57*[1/]
B	7	55.88	52.26	-3.62*	49.83	52.26	2.43
C	21	57.82	56.71	-1.11	52.50	56.71	4.21*
D	3	43.43	43.57	0.14	37.06	43.57	6.51*[1/]
E	8	58.96	53.48	-5.48*	52.97	53.48	0.51
F	4	35.27	37.33	2.06	31.50	37.33	5.83*
G	2	52.85	51.79	-1.06	46.14	51.79	5.65*[1/]
H	5	45.20	44.26	-0.94	39.55	44.26	4.71*
J	4	23.68	24.31	0.63	19.69	24.31	4.62*
K	7	47.72	42.00	-5.72*	40.18	42.00	1.82
N	2	53.60	54.74	1.14	50.31	54.74	4.43
P	2	36.57	35.12	-1.45	31.88	35.12	3.24
Q	3	43.43	45.69	2.26	39.85	45.69	5.84*
TOTAL	74	49.68	47.98	-1.70	44.21	47.98	3.77*

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

*[1/] Denotes statistical significance at the .05 level of confidence assuming minimal effects of covariance, but loss of statistical significance assuming large effects of covariance.

FLORIDA VERSUS NATIONAL AND SOUTHEAST READING RESULTS FOR 17-YEAR-OLDS
BY READING THEME USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Reading Theme	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
1	2	54.20	54.70	0.50	52.15	54.70	2.55
2	14	77.19	78.55	1.36*	72.08	78.55	6.47*
3	3	59.17	66.01	6.84*	53.10	66.01	12.91*
4	11	85.57	85.14	-0.43	77.81	85.14	7.33*
5	13	85.00	88.57	3.57	81.42	88.57	7.15*
6	6	80.02	81.75	1.73	74.78	81.75	6.86*
7	7	76.93	75.87	-1.06	71.89	75.87	3.98*
8	5	67.52	67.57	0.05	62.14	67.57	5.43*
TOTAL	61	78.18	79.58	1.40*[1/]	72.95	79.58	6.63*

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

*[1/] Denotes statistical significance at the .05 level of confidence assuming minimal effects of covariance, but loss of statistical significance assuming large effects of covariance.

FLORIDA VERSUS NATIONAL AND SOUTHEAST MATHEMATICS RESULTS FOR 17-YEAR-OLDS
BY MATHEMATICS CONTENT AREA USING AVERAGE PERCENTAGE OF ITEMS CORRECT

Mathematics Content Area	# of Items	Nation			Southeast		
		US	Fla.	Fla. Effect	SE	Fla.	Fla. Effect
A	4	57.79	53.33	-4.46*[1/]	53.36	53.33	-0.03
B	5	59.34	54.46	-4.88*	53.78	54.46	0.68
C	21	71.98	70.12	-1.86	68.13	70.12	1.99
D	3	60.11	60.36	0.25	56.85	60.36	3.51
E	6	66.06	66.19	0.13	60.35	66.19	5.84*
F	5	60.32	57.36	-2.96	55.14	57.36	2.22
G	5	55.87	55.85	-0.02	50.08	55.85	5.77*[1/]
H	5	59.04	57.94	-1.10	50.35	57.94	7.59*
I	2	32.87	37.27	4.40	26.21	37.27	11.06*
J	4	45.07	43.12	-1.95	38.94	43.12	4.18
K	5	47.13	40.42	-6.71*	37.25	40.42	3.17
N	2	59.94	60.80	0.86	54.84	60.80	5.96*
P	5	49.66	46.51	-3.15	44.27	46.51	2.24
Q	6	58.92	58.02	-0.90	52.77	58.02	5.25*
TOTAL	78	60.20	58.25	-1.95	54.69	58.25	3.56*[1/]

* Denotes statistical significance at the .05 level of confidence assuming large effects of covariance on NAEP items.

*[1/] Denotes statistical significance at the .05 level of confidence assuming minimal effects of covariance, but loss of statistical signficance assuming large effects of covariance.